**Psychology**

**Internal Assessment**

**Year 13 Student Guide**

**&**

**Psychology Rubrics for Standard Level/Higher Level**

**Name:………………………………**

**Form:……………………………….**

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**Psychology Internal Assessment Deadlines (Academic Year 2010-2011)**

**These deadlines are set in stone and cannot be changed.**

Each week you will be expected to write up (individually not in groups) each section of the Internal Assessment (IA).

Below are the deadlines set and the expected sections that you need to give to Miss Rajput.

|  |  |
| --- | --- |
| **Deadline Date** | **Structure of IA Planning Sessions** |
| 1. Thursday 23rd August/Friday 24th August | Formulation and Design of Experiment Hypothesis |
|  | \*\*You will have 2 weeks to collect Data by 1st lesson week commencing Monday 10th September. |
| 2. Week Commencing Monday 24th August | **DEADLINE**  Hand in Research Proposal Form to your teacher in the 1st lesson of the week  This needs to be checked by your teacher |
| 3. Week Commencing Monday 24th August | 1. Lesson (1)- Design of experiment materials in lesson 2. Lesson (2) – Methods Section Write Up   B) Lesson (2) – Introduction Section Write Up & References Section |
| 4. Week Commencing Monday 3rd September | **DEADLINE**  Hand in typed Methods Section in last lesson of the week |
| 6. Week Commencing Monday 10th September | Lesson (1) Results Analysis and HL only t-test analysis and Results Section Write Up  Lesson (2) Discussion Section Write Up |
| 5. Week Commencing Monday 10th September | **DEADLINE**  Data Collection from conducting your experiment should be collected. You will need this for this week for analysis |
| 6 Week Commencing Monday 10th September | **DEADLINE**  End of the week (last lesson) – Hand in Results Section |
| 6. Week Commencing Monday 17th September = MOVING ON WEEK | **DEADLINE**  To bring completed Introduction and References Section to 1st Lesson in Week Commencing Monday 24th September |
| 8. Week Commencing Monday 24th September | Lesson (1) Abstract Write Up  Lesson (2) Complete Write Ups |
| 9. Week Commencing Monday 24th September | **DEADLINE**  End of the week to Hand in Discussion and Abstract Section |

As per **IBO – Internal Assessment Guidelines and Procedures** – Miss Rajput is only allowed to mark **1 DRAFT copy** of your Internal Assessment.

Please make sure that you have added all the details expected per IBO standards in your draft.

|  |
| --- |
| **Deadline Date for 1st DRAFT of Internal Assessment will be**  **Friday 28th September 2012** |

Mrs Murphy and Miss Rajput will take your Internal Assessments and mark them over the Mid-Term Holiday (Monday 1st October – Sunday 7th October).

You will get your Internal Assessment back week commencing **Monday 8th October 2012**.

|  |
| --- |
| You will then have **2 weeks** to make changes, improvements, amendments to your Internal Assessment.  **Final Deadline for Psychology Internal Assessment**  **Friday 26th October 2012** |

**Experiment Types**

1. **You will need to read Experiments 1-5 and decide which experiment you would like to conduct.**
2. **You can only work in groups of 4**

**Experiment One**

**The Effect of Imagery on Recall in LTM**

The aim of this experiment is to find out whether it is easier to recall words that can be easily imagined (concrete- table) or those that cannot (abstract- emotion). This research is a modified replication of Richardson (1974).

It is a repeated measures design in which participants will be presented with concrete and abstract words and asked to recall them. The independent variable is whether the words are abstract or concrete, and the dependent variable is the number of words recalled.

You will need to think of 20 words, 10 of which can be easily imagined (concrete) and 10 which cannot (abstract). The words will need to be of a similar length, level of difficulty and familiarity; you can use a dictionary to check this. The words will then be presented in two similar lists, one of all concrete words and a second of all abstract words. After the first list, participants will have a time lapse of 1 minute, and then be asked to recall the words. This procedure will be repeated for the second list. You will need at least 10 participants.

The data that you will collect is at interval level, is related, and is looking for a difference in recall between the two conditions (concrete, abstract). Therefore, the appropriate test of statistical significance is a related t-test. The conventional level of significance is p<0.05.

In your introduction you will review previous research into this area, which will inform your choice of directional or non-directional hypothesis. Some of the appropriate literature for this area is listed below (hint! This is the order that the research will appear in your intro):

* Background research: Atkinson & Shiffrin (1968) [multi-store model] and Craik & Lockhart (1974) [levels of processing model]. You will find these in any AS textbook
* More specific research: Bower (1972) [imagery and words] , Anderson (1995) [bizarre images], and Pavio (1986) [dual-code model]. You will find these in either Gross & McIlveen *Psychology: a new introduction* (pages 246-247) or Gross 3rd edition (pages 296-297) and Gross 4th edition (257-258)
* The research to be replicated: Richardson (1974). You will be able to get a copy of this article from your teacher.

**Experiment Two**

**Levels of Processing in STM & LTM**

The aim of this experiment is to find out whether the level at which material is processed (encoded) affects how well it is remembered (visual or semantic).This research is a modified replication of Craik & Tulving (1975)

It is an independent groups design in which participants will be presented with words and asked questions about them. The questions will involve either shallow/ visual processing (such as “Is this word in upper or lower case?”), or deep/ semantic processing (such as ”would the word fit into the sentence ‘they met a \_\_\_\_\_ in the street’?”). The independent variable is the level of processing (shallow, deep), and the dependent variable is the number of words recalled.

You will need to think of 10 words. For each word you need to think of a shallow question, and a deep question. The words will then be presented to two different groups; each participant will then have to recall as many words as possible (free recall task). You will need at least 10 participants for each condition.

The data that you will collect is at interval level, is unrelated, and is looking for a difference in recall between the two conditions (shallow, deep). Therefore, the appropriate test of statistical significance is an unrelated t-test. The conventional level of significance is p<0.05.

In your introduction you will review previous research into this area, which will inform your choice of directional or non-directional hypothesis. Some of the appropriate literature for this area is listed below (hint! This is the order that the research will appear in your intro):

* Background research: Atkinson & Shiffrin (1968) [multi-store model] and Craik & Watkins (1973) [rehearsal] You will find these in Gross & McIlveen *Psychology: a new introduction* (pages 237-238)
* More specific research:, Craik & Lockhart (1974) [levels of processing], Bransford (1979) [elaboration] and Eysenck & Eysenck (1980) [distinctiveness] You will find these in either Gross & McIlveen *Psychology: a new introduction* (pages 237-238) or Gross 3rd edition (pages 290-291) and Gross 4th edition (255-256)
* The research to be replicated: Craik & Tulving (1975) You will be able to get a copy of this article from your teacher.

**Experiment Three**

**The Importance of Rehearsal in STM & LTM**

The aim of this experiment is to find out whether rehearsal aids memory. This research is a modified replication of Henderson (1999).

It is a repeated measures design in which participants will be presented with two lists of words. In one condition, the speed of delivery will be slow (1 word per second), while in the other it will be fast (1 word per 5 seconds). Participants will then be asked to recall as many words as possible (free recall task). The independent variable is the speed of delivery (slow, fast), and the dependent variable is the number of words recalled.

You will need to think of 15 words. The same words will be used on both lists. However, as the design is repeated measures, the order of the words will need to be varied. List A will then be presented to all participants; each participant will then have to recall as many words as possible (free recall task). The procedure will be repeated for list B. You will need at least 10 participants.

The data that you will collect is at interval level, is related, and is looking for a difference in recall between the two conditions (slow, fast). Therefore, the appropriate test of statistical significance is a related t-test. The conventional level of significance is p<0.05.

In your introduction you will review previous research into this area, which will inform your choice of directional or non-directional hypothesis. Some of the appropriate literature for this area is listed below (hint! This is the order that the research will appear in your intro):

* Background research: Differences in STM and LTM e.g. Baddeley (1966) [encoding], Jacobs (1887) [capacity], Peterson & Peterson (1959) [duration] and secondly Atkinson & Shiffrin (1968) [multi-store model]
* More specific research: Glanzer & Cunitz (1966) [primacy & recency effect] and Craik & Lockhart (1972) [elaborative & maintenance rehearsal] – you will find these in your AS textbook.
* The research to be replicated: Henderson (1999). You will be able to get a copy of this article from your teacher.

**Experiment Four**

**Relevance of Information on Recall**

The aim of this experiment is to find out whether relevance of the material to be recalled affects how well it is remembered. This research is a modified replication of Morris (1981).

It is an independent groups design in which participants will be assigned to conditions based on their assessed knowledge of football (expert, novice). NB: researchers will need to create a questionnaire and mark scheme which will assess football knowledge. Each group of participants will be presented with a set of football scores, and then immediately asked to recall them (free recall task). The independent variable is the relevance of the information (expert, novice), and the dependent variable is the number of scores recalled.

You will need to collect 20 football results NB: football supporters may already be familiar with recent or ‘famous’ results. The same results will be used for both groups.

The data that you will collect is at interval level, is unrelated, and is looking for a difference in recall between the two conditions (expert, novice). Therefore, the appropriate test of statistical significance is an unrelated t-test. The conventional level of significance is p<0.05.

In your introduction you will review previous research into this area, which will inform your choice of directional or non-directional hypothesis. Some of the appropriate literature for this area is listed below (hint! This is the order that the research will appear in your intro):

* Background research: Craik & Lockhart (1974) [levels of processing model] and Bartlett (1932) [schema research}- you will find these in your AS textbook.
* More specific research: Allport & Postman (1947) [schema research] – you will find this in your AS textbook; and Morris, Bransford & Franks (1977) [relevance on recall] – you will find this on a separate handout.
* The research to be replicated: Morris et al (1981). You will be able to get a copy of this article from your teacher.

**Experiment Five**

**The affect of leading questions on Recall**

The aim of this experiment is to find out whether leading questions affect participant recall. This research is a modified replication of Loftus & Palmer (1974).

It is an independent groups design in which participants will be assigned to one of two conditions (smashed, contacted) where they will be presented with a video clip of a vehicle crash, and then asked a series of questions based on the video; one of these questions will be a leading question containing one of the verbs above.

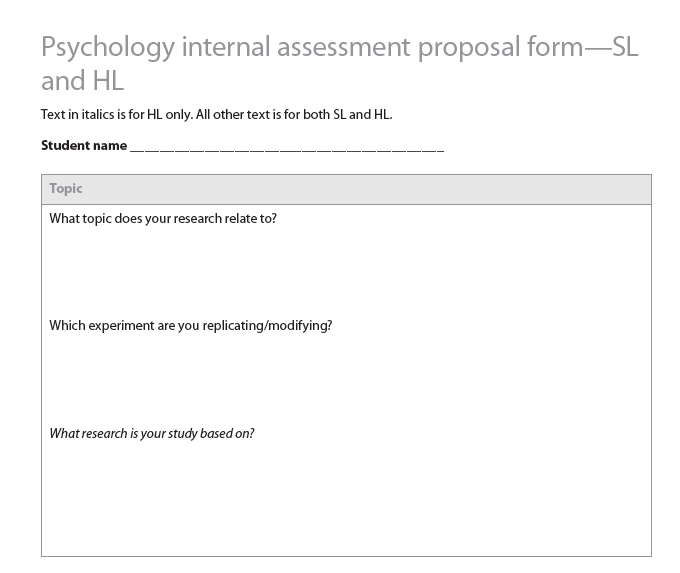
“How fast were the cars going when they \_\_\_\_\_\_\_ each other?”

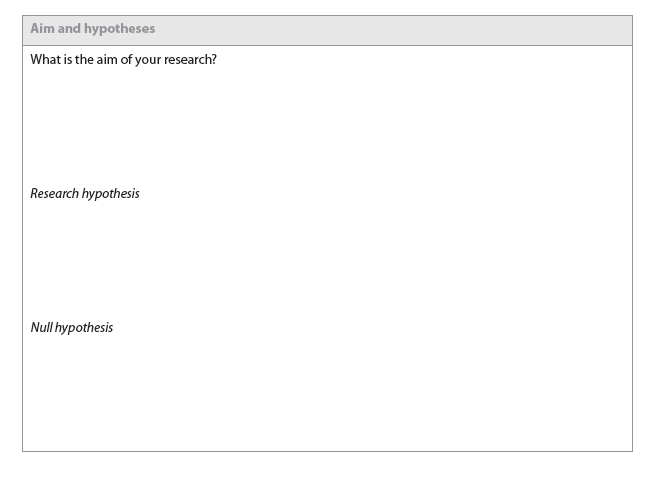
The independent variable is the verb used (smashed, contacted) and the dependent variable is the mph speed estimate. NB: researchers will have to find their own video/DVD of a crash. In doing this, you will need to consider ethical implications of age restrictions and suitability of material on certain DVDs.

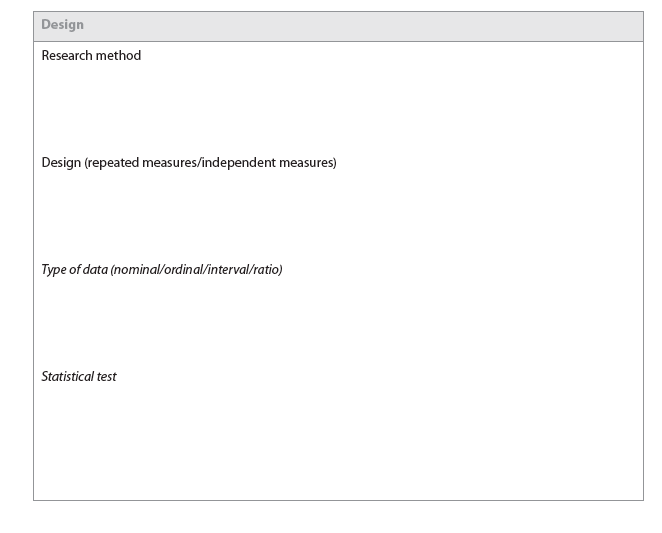
The data that you will collect is at interval/ratio level, is unrelated, and is looking for a difference in recall between the two conditions (smashed, contacted). Therefore, the appropriate test of statistical significance is an unrelated t-test. The conventional level of significance is p<0.05.

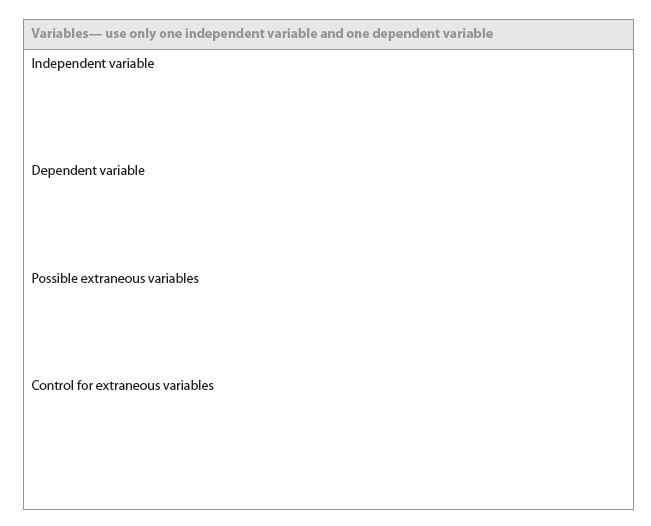
In your introduction you will review previous research into this area, which will inform your choice of directional or non-directional hypothesis. Some of the appropriate literature for this area is listed below (hint! This is the order that the research will appear in your intro):

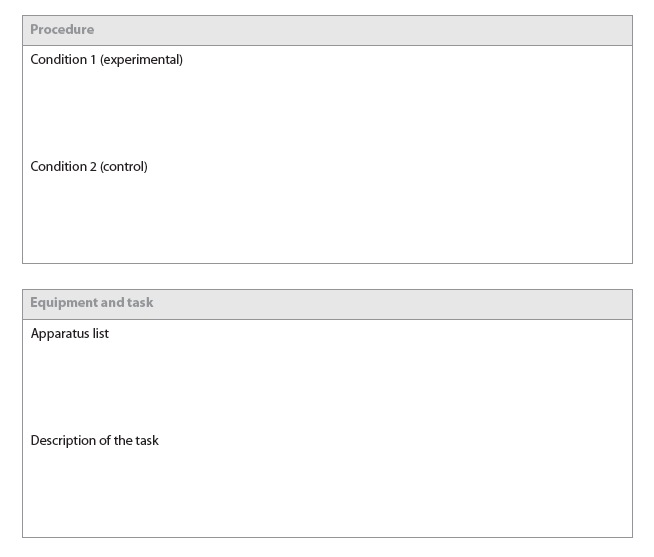
* Background research: and Bartlett (1932) [schema research] and Allport & Postman (1947) [schema research] - you will find these in your AS textbook.
* More specific research: Eakin et al (2003) [leading questions], Yuille & Cutshall (1986) [weapons effect] and Loftus & Zanni (1975) [leading questions] you will find this in your AS textbook
* The research to be replicated: Loftus & Palmer (1974). You will be able to get a copy of this article from your teacher.

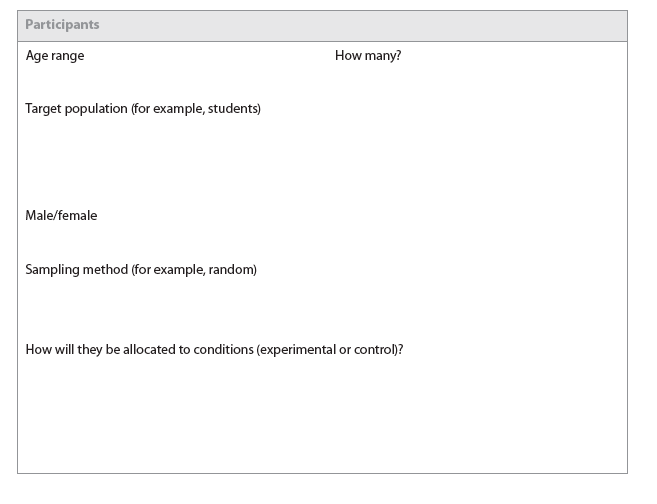


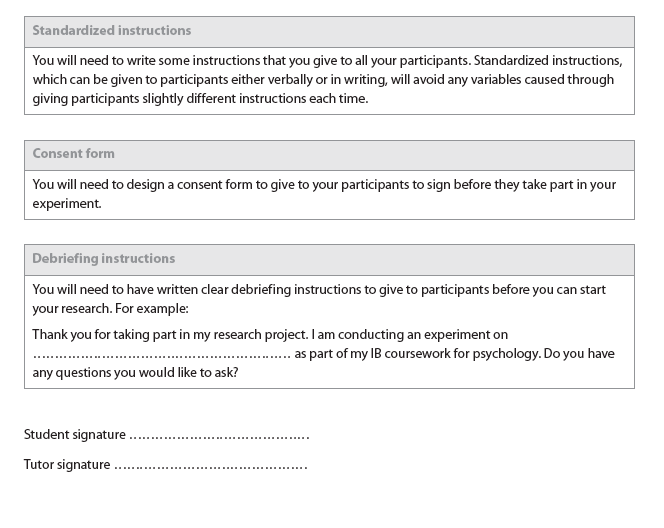
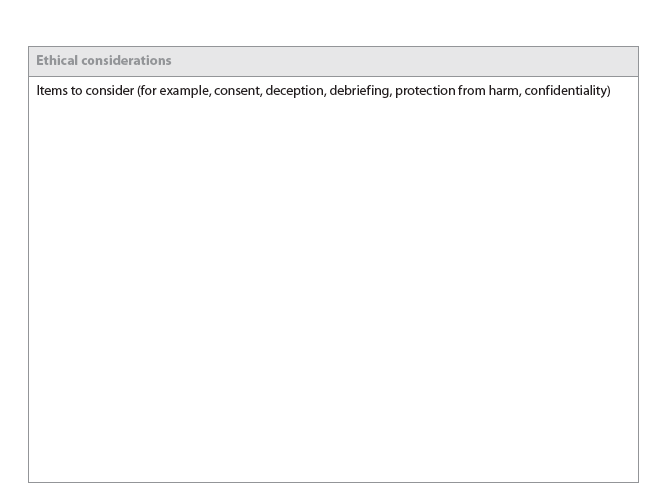


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**Designing Experiment Materials**

**You will need to create:**

1. **Consent Sheet**
2. **Standardised Instruction Sheet**
3. **Debriefing Sheet**
4. **Experiment Materials**

**Standard Level Criteria**

**Higher Level Criteria**

**Grade Boundaries for SL and HL**

**STANDARD LEVEL = Out of 20 marks**

|  |  |
| --- | --- |
| **Grade** | **Marks** |
| **1** | **0-2** |
| **2** | **3-5** |
| **3** | **6-8** |
| **4** | **9-10** |
| **5** | **11-12** |
| **6** | **13-14** |
| **7** | **15-20** |

**HIGHER LEVEL = Out of 28 marks**

|  |  |
| --- | --- |
| **Grade** | **Marks** |
| **1** | **0-2** |
| **2** | **3-5** |
| **3** | **6-9** |
| **4** | **10-13** |
| **5** | **14-17** |
| **6** | **18-21** |
| **7** | **22-28** |

**Writing Each Section of your Internal Assessment**

1. **Abstract**
2. **Introduction**
3. **Method**
4. **Results**
5. **Discussion**

Result Section Calculations

DESCRIPTIVE STATISTICS (SL AND HL)

Working Out Measures of Central Tendencies – Mean, Mode and Median

1. What are your raw scores? Devise a Table
2. How many participants took part in your experiment?

|  |  |
| --- | --- |
| Condition A | Condition B |
|  |  |
|  |  |
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|  |  |

Working out the Measures of Dispersion (Standard Deviation and Range)

1. Put your scores into a table

|  |  |  |  |
| --- | --- | --- | --- |
| **Score (X)** |  |  |  |
| 10 |  |  |  |
| 12 |  |  |  |
| 14 |  |  |  |
| 16 |  |  |  |
| 18 |  |  |  |

1. Work out the mean of your score and write this in the next column next to each score

|  |  |  |  |
| --- | --- | --- | --- |
| **Score (X)** | **Mean (Y)** |  |  |
| 10 | 14 |  |  |
| 12 | 14 |  |  |
| 14 | 14 |  |  |
| 16 | 14 |  |  |
| 18 | 14 |  |  |

1. Work out the difference between each score and the mean

* Use the calculation: score (X) – Mean (Y) = Difference (X-Y)
* Write each difference into the next column

|  |  |  |  |
| --- | --- | --- | --- |
| **Score (X)** | **Mean (Y)** | **Difference**  **(X-Y)** |  |
| 10 | 14 | -4 |  |
| 12 | 14 | -2 |  |
| 14 | 14 | 0 |  |
| 16 | 14 | 2 |  |
| 18 | 14 | 4 |  |

1. Square each difference (times by itself) and write each one into the next column

|  |  |  |  |
| --- | --- | --- | --- |
| **Score (X)** | **Mean (Y)** | **Difference**  **(X-Y)** | **Diff Squared**  **(X-Y)** |
| 10 | 14 | -4 | 16 |
| 12 | 14 | -2 | 4 |
| 14 | 14 | 0 | 0 |
| 16 | 14 | 2 | 4 |
| 18 | 14 | 4 | 16 |

1. Now you have to work out the variance.

* Do this by adding up all the scores from the 4th column
* Divide this number by your number of participants (N)
* The formula is: (X-Y) = S

N

(X-Y) = 40

40 = **8**

5

1. The standard Deviation is simply the square root of the variance

* The formula is: √S = SD. You will need a calculator to do this.

8 = 2.8284271 = **2.83**

That is it!!!

To make your results meaningful:

66% or 2/3 of your results should be within one standard deviation of the mean in order for your results to be normally distributed

To work this out: simply

1. mean + 1 SD = 1SD above the mean

14 + 2.83 = **16.83**

1. Mean – 1SD = 1SD below the mean

14 – 2.83 = **11.17**

SO: 66% of our original scores should be between **11.17 and 16.83**

Do they?

**Yes!! 12, 14, and 16 (60%) are all between 11.17 and 16.83.**

**10 and 18 are not**

**INFERENTIAL STATISTICS (HIGHER LEVEL ONLY)**

|  |
| --- |
| 1. **If you used a repeated measures design – you will need to calculate your t-score by using the RELATED t-test worksheet.**   **2) If you used an Independent measures design – you will need to calculate your t-score by using the UNRELATED t-test worksheet.** |

**Working out the Related t-test**

You use the related t-test when:

1. you have **interval/ ratio data**
2. you are looking for a **difference** between 2 sets of data
3. you have **related data** (i.e. you have used a repeated measures design)

When working this test out, all you need to do is carefully follow each step and take your time.

Step 1: Put all scores into a table. Put the condition which you expect people to score higher in, in the 2nd column (here in the same place as condition A).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** |  |  |
| 1 | 12 | 8 |  |  |
| 2 | 10 | 7 |  |  |
| 3 | 8 | 5 |  |  |
| 4 | 13 | 10 |  |  |
| 5 | 9 | 8 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Step 2: Calculate the mean for each condition. Put this at the bottom of the table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** |  |  |
| 1 | 12 | 8 |  |  |
| 2 | 10 | 7 |  |  |
| 3 | 8 | 5 |  |  |
| 4 | 13 | 10 |  |  |
| 5 | 9 | 8 |  |  |
|  |  |  |  |  |
| **Mean (X)** | 10.4 (Xa) | 7.6 (Xb) |  |  |

Step 3: Find the difference between conditions A and B. To do this, you must subtract each participant’s score in condition B from their score in condition A. Use the formula below to help:

Score in condition A (A) - score in condition B (B) = Difference (D)

Put the difference scores in column 4.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** | **Difference (D)** |  |
| 1 | 12 | 8 | 4 |  |
| 2 | 10 | 7 | 3 |  |
| 3 | 8 | 5 | 3 |  |
| 4 | 13 | 10 | 3 |  |
| 5 | 9 | 8 | 1 |  |
|  |  |  |  |  |
| **Mean (X)** | 10.4 (Xa) | 7.6 (Xb) |  |  |

Step 4: Square the difference (times by itself) for each participant. Put these squared differences in column 5.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** | **Difference (D)** | **Difference Squared**  **(DXD)** |
| 1 | 12 | 8 | 4 | 16 |
| 2 | 10 | 7 | 3 | 9 |
| 3 | 8 | 5 | 3 | 9 |
| 4 | 13 | 10 | 3 | 9 |
| 5 | 9 | 8 | 1 | 1 |
|  |  |  |  |  |
| **Mean (X)** | 10.4 (Xa) | 7.6 (Xb) |  |  |

Step 5:

a) Add up all the Differences (the 4th column). Put this total into the table. *This is called ∑d (the sum of d)*

b) Add up all the differences squared (the 5th column. Put this total into the table. *This called ∑d2 (the sum of d squared)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** | **Difference (d)** | **Difference Squared**  **(dXd))** |
| 1 | 12 | 8 | 4 | 16 |
| 2 | 10 | 7 | 3 | 9 |
| 3 | 8 | 5 | 3 | 9 |
| 4 | 13 | 10 | 3 | 9 |
| 5 | 9 | 8 | 1 | 1 |
|  |  |  |  |  |
| **Mean (X)** | 10.4 (Xa) | 7.6 (Xb) | ∑d = 14 | ∑d2 = 44 |

Step 6: Square ∑d. This called (∑d)2.

This is different from ∑d2. Don’t confuse the two!!!

Put your new score in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Participant number** | **Condition A** | **Condition B** | **Difference (d)** | **Difference Squared**  **(dXd))** |
| 1 | 12 | 8 | 4 | 16 |
| 2 | 10 | 7 | 3 | 9 |
| 3 | 8 | 5 | 3 | 9 |
| 4 | 13 | 10 | 3 | 9 |
| 5 | 9 | 8 | 1 | 1 |
|  |  |  |  |  |
| **Mean (X)** | 10.4 (Xa) | 7.6 (Xb) | ∑d = 14 | ∑d2 = 44 |
|  |  |  | (∑d)2 = 196 |  |

Step 7: Multiply the number of participants that you used (N) by ∑d2

5 X 44 = 220.

Step 8: Subtract (take away) the result of step 6 [(∑d)2] from the result of step 7 [220]

220 – 196 = 24

Step 9: Divide the result of step 8 (24) by your number of participants minus 1 (N-1).

Result of step 8 = 24

Number of participants = 5

Number of participants -1 = 4

24 = 6

4

Step 10: Find the square root of step 9. You will need to use a calculator for this.

√ 6 = 2.45

Step 11: Divide ∑d by the result of step 10 to give t.

∑d = 14

Step 10 = 2.45

14 = 5.71

2.45

**t = 5.71**

Step 12: Find your degrees of freedom. This is simply Number of participants minus 1 (N-1) = 4

DF = 4

Step 13: Find out whether your statistical test is significant or not. Use the statistical table.

1) Work out whether your test is one tailed or two tailed. You are looking for significance at the **0.05 level**.

2) Find your degrees of freedom

3) Meet parts 1 and 2 in the table; they will indicate a **critical table value**. In this case the critical value is 2.132.

Your calculated t value must be equal to or higher than the critical value for significance at the 0.05 level.

t = 5.71 and the critical value is 2.132. Calculated t is larger than the critical value when df = 4, therefore this test is significant at the 0.05 level.

**Therefore, the directional experimental hypothesis is supported, and the null hypothesis can be rejected.**

Working out the Unrelated t-test

You use the unrelated t-test when:

1. you have **interval/ ratio data**
2. you are looking for a **difference** between 2 sets of data
3. you have **unrelated data** (i.e. you have used an independent groups design)

When working this test out, all you need to do is carefully follow each step and take your time.

Step 1: Put all scores into a table like the one shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of words correctly recalled in:** | | | |
| **Condition A** | | **Condition B** | |
| Num of P’s (N)  N = 6 |  | Number of P’s (N)  N = 5 |  |
| **Score (Xa)** |  | **Score (Xb)** |  |
| 10 |  | 7 |  |
| 8 |  | 5 |  |
| 11 |  | 10 |  |
| 13 |  | 8 |  |
| 7 |  | 7 |  |
| 9 |  |  |  |
|  |  |  |  |
|  |  |  |  |

Step 2:

a) Add up all scores from condition A (Xa) to give ∑Xa

b) Add up all the scores from condition B (Xb) to give ∑ Xb

Put these into the table

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of words correctly recalled in:** | | | |
| **Condition A** | | **Condition B** | |
| Num of P’s (N)  N = 6 |  | Number of P’s (N)  N = 5 |  |
| **Score (Xa)** |  | **Score (Xb)** |  |
| 10 |  | 7 |  |
| 8 |  | 5 |  |
| 11 |  | 10 |  |
| 13 |  | 8 |  |
| 7 |  | 7 |  |
| 9 |  |  |  |
|  |  |  |  |
| ∑Xa = 58 |  | ∑Xb = 37 |  |

Step 3: Square all of the scores (times by themselves) and put these into the table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of words correctly recalled in:** | | | |
| **Condition A** | | **Condition B** | |
| Num of P’s (N)  N = 6 |  | Num of P’s (N)  N = 5 |  |
| **Score (Xa)** | **Score squared (Xa2)** | **Score (Xb)** | **Score squared (Xb2)** |
| 10 | 100 | 7 | 49 |
| 8 | 64 | 5 | 25 |
| 11 | 121 | 10 | 100 |
| 13 | 169 | 8 | 64 |
| 7 | 49 | 7 | 49 |
| 9 | 81 |  |  |
|  |  |  |  |
| ∑Xa = 58 |  | ∑Xb = 37 |  |

Step 4:

a) Add up all of the scores squared in condition A to give ∑Xa2

b) Add up all of the scores squared in condition B to give ∑Xb2

Put these into the table

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of words correctly recalled in:** | | | |
| **Condition A** | | **Condition B** | |
| Num of P’s (N)  N = 6 |  | Num of P’s (N)  N = 5 |  |
| **Score (Xa)** | **Score squared (Xa2)** | **Score (Xb)** | **Score squared (Xb2)** |
| 10 | 100 | 7 | 49 |
| 8 | 64 | 5 | 25 |
| 11 | 121 | 10 | 100 |
| 13 | 169 | 8 | 64 |
| 7 | 49 | 7 | 49 |
| 9 | 81 |  |  |
|  |  |  |  |
| ∑Xa = 58 | ∑Xa2 = 584 | ∑Xb = 37 | ∑Xb2 = 287 |

Step 5: Square the sum of scores from Condition A (bottom of column 1) and B (bottom of column 3).

a) sum of square scores from condition A: (∑Xa)2 = 3364

b) sum of square scores from condition B: (∑Xb)2 = 136

BE CAREFUL: ∑Xa2 is different from (∑Xa)2 don’t confuse them!

Put these in the table

Step 6: Divide the results from step 5 for condition A, by the number of participants in condition A. Do the same for condition B.

Condition A: (∑Xa)2 3364 = 560.67

N 6

Condition B: (∑Xb)2 136 = 27.2

N 5

Step 7:

a) Subtract (take away) the result of step 6, condition A from step 4 condition A.

∑Xa2 - (∑Xa)2 = 584 – 560.67 = 23.33

N

b) Subtract (take away) the result of step 6, condition B from step 4 condition B.

∑Xb2 - (∑Xb)2 = 287 – 27.2 = 259.8

N

Step 8: Add together the results from step 7

23.33 + 259.8 = 283.13

Step 9: Divide the result of step 8 by (Na + Nb -2)

283.13 283.13 = 31.46

(6 + 5 – 2) 9

Step 10: Multiply the result of step 9 by Na + Nb

Na x Nb

31.46 x (6 + 5) 31.46 x 11 31.46 x 0.37 = 11.64

(6 x 5) 30

Step 11: Find the square root of step 10. You will need a calculator for this.

√11.64 = 3.41

Step 12: Work out the mean for each condition

Mean from condition a = 9.67

Mean from condition b = 7.4

Step 13: Find out the difference between the 2 means

Mean from condition A – mean from condition B

9.67 – 7.4 = 2.27

Step 14: Divide the result of step 13 by the result of step 11.

2.27 =

3.41

**t = 0.67**

Step 15: Calculate the degrees of freedom

Df = Na + Nb – 2 Df = 6 + 5 -2 Df = 9

Step 16: Find out whether your statistical test is significant or not. Use the statistical table.

1) Work out whether your test is one tailed or two tailed. You are looking for significance at the **0.05 level**.

2) Find your degrees of freedom

3) Meet parts 1 and 2 in the table; they will indicate a **critical table value**. In this case the critical value is 1.833.

Your calculated t value must be equal to or higher than the critical value for significance at the 0.05 level.

t = 0.67 and the critical value is 1.833. Calculated t is smaller than the critical value when df = 9, therefore this test is non significant at the 0.05 level.

**Therefore, the directional experimental hypothesis is rejected, and the null hypothesis can be accepted.**

**Writing your Discussion section**

**Harvard Referencing + References Section**

**Appendices Section**

**Grading Sheets – Standard Level**

**Grading Sheets – Higher Level**

**Checklist for Each section of your IA**

**Example of Standard Level IA Report**

**Example of Higher Level IA Report**