PSYCHOLOGY

Psychology Experiment Practical Workbook

Name



Psychology at Budmouth Academy

Practical One:

Do we smile because we're happy or are we happy because we smile? You're asked to design a practical project to investigate whether smiling causes people to feel happier. Your project must use an experimental method having an independent-measures design. You'll use an opportunity sample of participants randomly allocated to two conditions. In condition 'Smile', participants will be asked to hold a pencil between their teeth, not touching their lips (forced smile) for 30 seconds. In condition 'Frown', participants will be asked to hold a pencil between their lips, not touching their teeth (forced frown) for 30 seconds. At the end of the 30 seconds you'll ask participants to rate how happy they feel.

You'll need: a clean, unused pencil for each participant (or you could ask them to provide their own pencil) and a rating scale to measure happiness.

Rating happiness

Please circle the number that best corresponds to how happy you feel:

5 6 0 1 2 3 4 7 8 9 10 Not very happy Very happy

Practical Two:

Psychological research suggests that physical exercise improves mood.

You're asked to design a practical project to investigate whether brief physical exercise has a positive effect on mood. Your project must use an experimental method and use a repeated-measures design and use a rating scale to measure mood.

You could use: skipping ropes, somewhere to ask participants to run or jog or dance. You'll need a rating scale to measure mood.

Rating Mood

Please circle the number that best corresponds to how you feel:

5 0 1 2 3 4 6 7 8 9 10 In a very positive mood

Not in a positive mood

Practical Three:

Some psychologists suggest that eating chocolate cheers people up.

Design and carry out an experiment to test the theory that people who eat a small square of chocolate will report feeling more cheerful than people who haven't eaten chocolate. You must use an independent-measures design and use a rating scale to measure mood.

You'll need: one plate of small cubes of chocolate (or chocolate buttons) and a rating scale to measure cheerfulness.

Practical Four:

You're asked to design a practical project to investigate whether chewing gum improves concentration. Your project must use an experimental method, must have an independent-measures design and must collect quantitative data. Hint: your project could measure concentration by giving participants a page of text to read, and asking them to cross out every letter 'e' they read in a fixed time of 30 seconds.

You'll need: several packs of chewing gum, photocopied page of any text/book.

Task 1: Writing research aims and guestion

Write a research aim and question for each of the practical projects. State whether the research question is descriptive, relational or causal.

Example	Aim: To investigate if we smile because we're happy or if we're happy because we smile.
smiling/happiness	Question: Do we smile because we're happy or are we happy because we smile? Causal

	Aim:
Practical 2: exercise/mood	
	Question:

	Aim:
Practical 3:	
chocolate/cheerfulness	Question:
	Aim:
Practical 4:	
chewing gum/concentration	Question:

Task 2: Writing hypotheses Write the IV and a DV for each of the practicals, then operationalize them. Then go on to write both a null and alternative hypothesis.

	IV: <i>Smiling</i> : operationalized by participants being asked to hold a pencil between their teeth, not touching their lips (forced smile) for 30 seconds. Or	DV: <i>Level of happiness:</i> measured by participants using self-report to fill in a 10-point semantic differential scale where 1 equals not very happy and	
Example	by participants being asked to hold a pencil between their lips, not touching their teeth (forced frown) for	10 equals very happy.	
Practical 1: smiling/happiness	Null hypothesis: There'll be no significant difference between levels of happiness measured by participants using self-report to fill in a 10-point semantic differential scale where 1 equals not very happy and 10 equals very happy dependent upon whether participants are holding a pencil between their teeth, not touching their lips (forced smile) for 30 seconds or if they're holding a pencil between their lips, not touching the toth (forced forced smile) for 30 seconds or up difference will be due to chappe		
	Alternative hypothesis: There'll be a significant participants using self-report to fill in a 10-point sema and 10 equals very happy dependent upon whether pa touching their lips (forced smile) for 30 seconds or if their teeth (forced frown) for 30 seconds.	difference between levels of happiness, measured by antic differential scale where 1 equals not very happy rticipants are holding a pencil between their teeth, not hey're holding a pencil between their lips, not touching	

	IV:	DV:
Practical 2: exercise/mood	Null hypothesis:	
	Alternative hypothesis:	
	IV:	DV:
Practical 3: chocolate/cheerfulness	Null hypothesis:	
	Alternative hypothesis:	

	IV:	DV:
	Null hypothesis:	
Practical 4: chewing gum/concentration		
	Alternative hypothesis:	

Task 3: Selecting a sample

Decide who your population is going to be for each practical. Choose a sampling technique and say exactly how you're going to put that technique into practice. You'll need to state who, how, when and where you're going to obtain your sample. Remember, it MUST be replicable (that is, someone else could come along and do it). Then, write a strength and weakness of your sampling method and relate them to the practical. (Think: PEC.)

<i>Example</i> Practical 1: <i>smiling/happiness</i>		
Population: Sixth-form students in the UK. Sampling method: Opportunity sample.		
In practice: The sample will be gathered by a psychology teacher asking each of the students in her/his psychology class to participate during a psychology lesson on a Monday morning.		
Strength: The participants are readily available. This can be seen as participants are students in a teacher's psychology class who were easily available to the teacher at the time. This means that it's quicker and easier than other methods.	Weakness: Non-representative as the kinds of people available are likely to be limited, and therefore similar. This can be seen as all the participants are students taking psychology A level in one particular sixth form who are likely to have a number of characteristics in common as a particular type of person may be attracted to studying psychology. This means that the sample is biased.	

Practical 2: exercise/mood		
Population:	Sampling method:	
In practice:		
Strength:	Weakness:	

Practical 3: chocolate/cheerfulness		
Population:	Sampling method:	
In practice:		
Strength:	Weakness:	

Practical 4: chewing gum/concentration		
Population:	Sampling method:	
In practice:		
Strength:	Weakness:	

Task 4: Experimental (research) design

State which experimental design you're going to use for each practical. If it's independent measures state how you'll allocate them to each condition, if it's matched pairs you'll need to state the **relevant** characteristic(s) you're going to match on, and if it's repeated measures, if you're going to offset to avoid order effects how you're going to decide who does condition **a** first and then **b**, and who does condition **b** first and then **a**. Then write a strength and weakness of your research design, remembering to relate it to your practical. (Think: PEC.)

Example	Design: Independent meas	ures.
Practical 1:		
smiling/happiness	Allocation to groups: M	ust be randomly allocated to the 'smile' condition and the 'frown'
5, 11	condition, so the names of	each of the participants will be written on a piece of paper and
	placed into a hat. The first	10 names pulled out will be in the 'smile' condition and the
	remaining to will be in the i	
Strength: Participants only see	the experimental task once.	Weakness: Participants in one level of the IV may differ from
This can be seen as participants	will only take part in one	those in another. For example, it may be that there will be a
condition of the experiment, smile	or frown, which means that	bias as participants who are naturally happy end up in the
there's reduced exposure to	demand characteristics as	frown condition and participants who are naturally more
participants are unlikely to guess the	ne aim of the experiment.	grumpy may end up in the 'smile' condition, meaning that
		individual differences may distort results.

Design:		
exercise/mood	Allocation to groups:	
Strength:		Weakness:
Practical 3:	Design:	
chocolate/cheerfulness	Allocation to groups:	
Strength:		Weakness:
	Design:	1
Practical 4: chewing gum/concentration	Allocation to groups:	
Strength:	1	Weakness:

Task 5: Identifying/controlling and minimizing extraneous variables

There are a number of different types of extraneous variables. These include: individual participant differences, demand characteristics, placebo effects, experimenter effects, order effects, artificiality, and the use of non-standardized instructions and procedures.

Ways to control and minimize the effects of extraneous variables include: participant selection and allocation, counterbalancing, single-blind procedures, double-blind procedures, placebos, standardized instructions and procedures, and experimental research designs (repeated measures, matched participants and independent groups).

In the first table for each practical state how each extraneous variable could affect the study. In the second table state how you'll operationalize each control to prevent the extraneous variable from becoming a confounding variable.

Extraneous variable	Description
Individual participant variables	Practical 1: <i>smiling/happiness</i> Some people may be naturally happier than other people.
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration

	Practical 1: smiling/happiness
	They may work out that I'm investigating smiling and happiness and decide to lie on
Demand characteristics	the self-report to either help me get the results I expect or to deliberately mess it up.
	Bractical 2: ovorciso/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
	Practical 1: smiling/happiness
	I may be more cheerful and upbeat in the smile condition. The fact that I'm a teacher
Experimenter effects	could freak some people out or they may feel they have to give me the correct answer
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
	Practical 1: smiling/happiness
	Not an issue as I'm using an independent measures design.
Order effects	······································
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
	ructical 41 chewing gain/concentration
	Practical 1: smiling/happiness
	It's really weird to hold a pencil in between your teeth or between your lips for 30
Artificiality	seconds.
	Practical 2: evercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
	Bractical 1: smiling/happiness
	I could change what I say to each group and not explain what I want as well to one
Non-standardized instructions	group as to another. It might be really hot or cold in the classroom, the lawnmower
and procedures	could be going outside for one group and not another, or it could be sunny for one
P	group and grey and overcast for another.
	Bractical 2: overcise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration

Method	Description
Participant selection and	Practical 1: <i>smiling/happiness</i> I'll randomly allocate participants to the smile or frown condition by putting their names in a hat. The first 10 will be in the smile condition and the rest in the frown.
allocation	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
Counterbalancing	Practical 1: <i>smiling/happiness</i> Don't need to do this as I'm using independent measures.
-	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
Single-blind procedure	Practical 1: <i>smiling/ happiness</i> I'll not tell my participants what I'm looking for until after they've completed the experiment.
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
Double-blind procedure	Practical 1: <i>smiling/happiness</i> I could write a set of standardized instructions and get another teacher, who doesn't know what I'm researching, to read them to the class.
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
Standardized instructions and procedures	 Practical 1: smiling/happiness I can write a set of standardized procedures that give participants the instructions. I can ensure the blinds are drawn so they both just have electric light and ensure the temperature of the classroom stays the same for both conditions. I can also use the same room, and conduct the experiment at the same time of day for each group. Or I could use two similar classrooms and experiment with both groups at the same time. Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4. chowing gum/concentration

Experimental research design	Practical 1: <i>smiling/happiness</i> I could use a matched-pairs design and ask participants to rate themselves whether they consider themselves to be a happy person or not and then ensure there's the same mix of responses in each group.
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration

Task 6: Reliability and validity Consider each practical and suggest how reliable and valid each is. *Hint:* use your work on controlling extraneous variables, aspects of the experimental design and sampling techniques to help with this. (PEC.)

Reliability	How reliable is each practical?
Internal reliability	 Practical 1: smiling/happiness The research has a high level of internal reliability as the task is precisely described and standardized. This can be seen as each participant will either hold a pencil between their teeth ensuring it doesn't touch their lips (smile condition) or they'll hold a pencil between their lips ensuring it doesn't touch their teeth (frown condition). This means it's highly replicable. Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
External reliability	 Practical 1: <i>smiling/happiness</i> The external reliability is good. Should the test be repeated in three months using the test-retest mechanism, because the procedure is highly standardized as each participant will either hold a pencil between their teeth ensuring it doesn't touch their lips (smile condition) or they'll hold a pencil between their lips ensuring it doesn't touch their teeth (frown condition) it's highly replicable and I would anticipate similar scores on participants self-rating of happiness. Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration
Validity	How valid is each practical?
Internal validity (face, content, criterion)	Practical 1: <i>smiling/happiness</i> The internal validity of the experiment is good. The experiment is highly controlled as participants have been randomly allocated into the 'smile' and 'frown' conditions minimizing participant variables. There are standardized instructions to reduce experimenter effects and all other factors of the environment, such as time of day and temperature have been standardized to ensure situational variables don't impact on the test. This suggests that the experiment is measuring what it intends to measure.
	Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness
	Practical 4: chewing gum/concentration

External validity (population, ecological)	Practical 1: <i>smiling/happiness</i> The external (ecological) validity of the experiment is very poor. It's not normal to have to hold a pencil in between your teeth to force a smile or between your lips to force a frown and thus the mundane realism is poor. In addition, the population validity is weak as participants were gathered by opportunity sample from a single psychology class. This therefore means that it'll be difficult to generalize the results beyond the confines of the experimental groups. Practical 2: exercise/mood
	Practical 3: chocolate/cheerfulness Practical 4: chewing gum/concentration

Task 7: Collecting data For each practical, state what data you'll collect and what type of data they are. Then sketch out a raw data table to collect the data for each practical.

	Level of data: Level of 10-point semantic differe happy. This'll give ordin Raw data collection	f happiness: measur ential scale where 1 e al data. table:	ed by participants using se equals not very happy and	elf-report to fill in a 10 equals very
	'Smile' condition		'Frown' condition	
Example	Participant	Rating	Participant	Rating
	Α		K	
Practical 1:	В		L	
smiling/happiness	С		м	
	D		N	
	E		0	
	F		Р	
	G		Q	
	н		R	
	I		S	
	J		Т	

	Level of data:
Practical 2: exercise/mood	Raw data collection table:
	Level of data:
	Raw data collection table:
Practical 3: chocolate/cheerfulness	

	Level of data:
	Raw data collection table:
Practical 4: chewing gum/concentration	

Task 8: Ethics For each of the following issues state how you'll ensure that each practical is ethical.

Example		
	Practical 1: smiling/happiness	
Issue	Possible solutions	
Consent	Give a full brief to participants so they can give informed consent. Offer the right to withdraw.	
	There will also be a full debrief at the end where participants are reminded of their right to withdraw their	
	results and are offered support should they require it.	
Deception	There's no deception, participants are aware of what the study is investigating.	
,		
Withdrawal	Tell participants at the start of the study that they've the right to leave and to withdraw their results.	
	Remind them later in the study.	
Confidentiality	Participants' names won't be recorded, or letters will be used instead.	
,		
Protection	The procedure is safe for participants. Clean pencils will be used that have been wiped with antibacterial	
	wipes to ensure they are hygienic.	

Practical 2: exercise/mood		
Issue	Possible solutions	
Consent		
Deception		
Withdrawal		
Confidentiality		
Protection		
	Practical 3: chocolate/cheerfulness	
Issue	Possible solutions	
Consent		
Deception		
Withdrawal		
Confidentiality		
Protection		

Practical 4: chewing gum/concentration		
Issue	Possible solutions	
Consent		
Deception		
Withdrawal		
Confidentiality		
Protection		

Task 9: Conducting your practical

You're now at the stage where you can conduct your own practical. In discussion with your teacher choose Practical 2, 3 or 4 and using the work you've prepared above, gather your materials (keep a list and examples of the apparatus you use). Write your standardized procedure (think about timings) including standardized instructions. Find a room where you can conduct your experiment, gather your sample and collect your data using the raw data table you generated. Remember the controls you need to put in place and don't break any ethical guidelines. Good luck – you're about to become a psychological researcher!

Pilot studies

A pilot study is a small-scale trial run of a research design before doing the real thing. It's done in order to find out if certain things don't work. For example, participants may not understand instructions or, in the case of an experiment, might guess what it's all about. Behavioural categories may be unclear, or overlap in an observation. In a self-report or experiment participants may get very bored because there are too many tasks or questions and not give truthful answers. Thus the aim of a **pilot study** is to check the method (not to see if the results are what was expected) and find solutions to any issues. This improves reliability and validity. For an experiment it's important to check:

- the participants can follow the standardized instructions,
- that the apparatus and materials are appropriate,
- that the DV covers the full range of scores (to avoid floor all too hard, or ceiling all too easy, effects),
- for any possible extraneous variables that need to be controlled,
- whether any aspects of the procedure will lead to demand characteristics,
- whether there are any order effects in a repeated-measures design.

Task 10: Descriptive statistics

Task 10a: Using the data you collected whilst conducting your practical calculate the mean, median and mode for your data set. Write a short paragraph that explains what's in the descriptive statistics table. (*This paragraph should be short, but it should clarify the table.*)

<i>Example</i> Practical 1: smiling/happiness						
Condition 1: 'Smile'		Condition 2: 'Frown'				
Mean	Median	Mode		Mean	Median	Mode
What does this tell us?						

Practical:					
Condition 1: Condition 2:					
Mean	Median	Mode	Mean	Median	Mode
What does this tell us?					

Task 10b: Now calculate the range of the data for each condition, the variance and the standard deviation. Again write a short paragraph that explains what's in the descriptive statistics table. (*In particular address any outliers that may have skewed the data and which may account for any high standard deviations.*)

<i>Example</i> Practical 1: <i>smiling/happiness</i>					
Condition 1: 'Smile	e'		Condition 2: 'Frow	n'	
Range	Variance	Standard deviation	Range	Variance	Standard deviation
What does this t	ell us?				

Practical:					
Condition 1: Condition 2:					
Range	Variance	Standard deviation	Range	Variance	Standard deviation
What does this tell us?					

Task 10c: Now create a graph to present your data. You may choose to have two graphs showing the results of each condition, or you may prefer to present your data on one graph. Ensure it's relevant and adds to the information already presented. Check the labelling, there should be a title and each axis should be clearly labelled.

Example Practical 1: smiling/happiness

Practical:

Task 11: Inferential statistics

The next task is to choose an appropriate inferential statistical test. Start by answering the test selection questions, after which calculate your test, see if the results are significant using the appropriate critical value table, and then conclude by accepting or rejecting your null hypothesis.

<i>Example</i> Practical 1: <i>smiling/happiness</i>			
Level of data: Ordinal	Parametric or non-parametric: Non-parametric		
Experimental (research) design: Independent measures			
Inferential statistical test: Mann-Whitney U test			

Calculation:	
Level of Significance: <i>p</i> <0.05	One-tailed or two-tailed: Two-tailed
Critical value =	
Accept or reject null hypothesis:	

Practical:		
Level of data:	Parametric or non-parametric:	
Experimental (research) design:		
Inferential statistical test:		

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Level of Significance:	One-tailed or two-tailed:
Critical value =	
Accept or reject null hypothesis:	

Task 12: Writing up your practical

There's step-by-step guidance as to how to write a research report in the *Psychology and Science* handout. But for even more information check out this website from the University of Nottingham:

http://www.psychology.nottingham.ac.uk/staff/jas/yr1pracs/c81mprpracs.htm

In addition to this there's guidance you can get from me from the University of Essex.

Deadline:

Calculation: