4.2 HL: technology and behaviour

Name: _____ Class: _____ Date: _____ **Total: 30 marks**

KEY WORDS effect size • correlation • replication • working memory • Google effect

Objective

Build the skills to answer HL questions on **technology** and behaviour: social media and well-being, smartphones and attention, technology and memory, and how to judge claims about technology from the evidence.

You must be able to:

- describe Orben and Przybylski (2019) and explain what a small effect size means
- describe Ward et al. (2017) and explain why replication matters
- explain the Google effect (Sparrow et al., 2011)
- evaluate claims about technology with causality and measurement

1 Key knowledge and worked examples

The evidence

- **Social media and well-being:** Orben and Przybylski (2019) analysed three large data sets with more than **350,000** teenagers. Technology use had a negative link with well-being, but it explained **at most 0.4 %** of the differences in well-being, about as much as eating potatoes. The data were **correlational**: unhappy teenagers may also use more social media.
- **Smartphones and attention:** Ward et al. (2017) gave students working-memory tests with their phone on the desk (face down, silent), in a bag, or in another room. They did best with the phone in **another room**, even without using it. Later studies did not always find the effect, so wait for **replications** before changing rules.
- **Technology and memory:** Sparrow et al. (2011): people remember **where** information is stored rather than the information itself when they expect to find it online (the Google effect).

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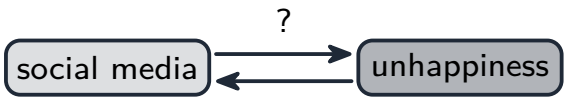
■ **Judging claims**

question	example
cause or correlation?	screen time and unhappiness move together, but which causes which?
how big is the effect?	a statistically significant effect can be tiny in a huge sample
how was it measured?	self-reported hours of use are often inaccurate
has it been repeated?	a single striking study may not replicate

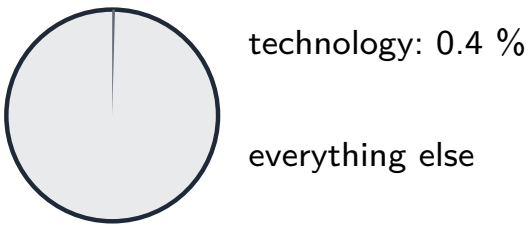
Context: in 2021 China limited online games for under-18s to one hour on Friday, Saturday and Sunday evenings and on public holidays: a policy based on claims about technology, motivation and culture.

2 Practice

2.1 Explain why correlational data cannot show that social media causes unhappiness. [2]



2.2 Orben and Przybylski (2019) found that technology use explained at most 0.4 % of the differences in teenagers' well-being. Explain what this means for the claim that social media makes teenagers unhappy. [3]

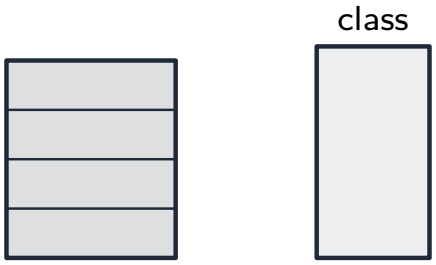


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2.3 *(Section A style.)* Describe **one** study of how smartphones affect cognition. [4]



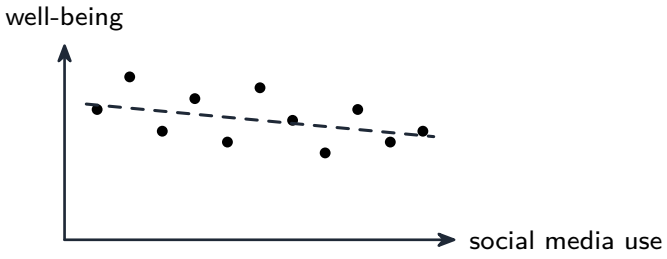
2.4 *(Section B style.)* A school plans to ban phones from classrooms to improve learning. Using research, explain whether this plan is likely to help. [6]



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3 Exam-style questions

3.1 *(Section C style.)* "Social media harms teenagers' well-being." Evaluate this claim with reference to the concept of **causality**. [15]



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Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

a correlation only shows that the two variables move together; unhappy teenagers may use social media more (reverse direction), or a third variable such as loneliness may affect both

2.2

the link is real but very small: more than 99 % of the differences in well-being come from other factors; about the same as eating potatoes, so it is not a major cause; and the data are correlational, so even this small link may not be cause

2.3

Ward et al. (2017); students did working-memory tests with their phone on the desk face down and silent, in a bag, or in another room; they did best with the phone in another room, although they did not use it; suggests the phone's presence uses up attention; later studies did not always repeat the effect

2.4

award up to [6]: Ward et al. (2017): working memory was best with the phone in another room; so phones kept outside the room may free attention for learning; but later studies did not always repeat this, so the effect may be small or uncertain; Sparrow et al. (2011): people remember less when they expect to look things up, so less reliance on phones in class could help memory; but phones can support learning, e.g. dictionaries and calculators; the school should test the ban, e.g. compare results before and after, and involve students (autonomy)

3.1

Mark with the markbands: [13-15] focused on the claim, accurate knowledge, evidence used to build an argument, the concept used to evaluate throughout, a supported conclusion; [10-12] mostly focused, evidence used, some evaluation through the concept; [7-9] relevant knowledge but mostly description; [4-6] limited knowledge, little evaluation; [1-3] little that is relevant. Points that may be included: Orben and Przybylski (2019): a negative link, but at most 0.4 % of the variation; large samples give confidence that the link exists but show it is small; causality: correlational data cannot show direction: unhappy teenagers may use more social media; third variables such as sleep, loneliness or family problems could affect both; experiments that reduce use for a short time could test cause, but they are short and participants know the aim; measurement: self-reported hours are often inaccurate, and "social media" covers many different activities; the effect may differ between individuals: harmful for some, helpful for others; conclusion: the evidence supports a small link for the average teenager, but not a strong causal claim

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