**General Learning Outcomes**

* Outline principles that define the BLOA SAQ only (SAQ 2012)

The use of ‘principles’ indicates that two are required. The question will specify (last year the SAQ required one.

Below are suggestions, you do not have to use exact wording. You must explain the principle fully and must include a study or theory or general concepts.

* Human behavior is to some extent genetically based (Nurnberger and Gershon. Twin study on depression) p54 study guide (Kendler et al. Twin study on Bulimia) p56 study guide
* Behaviour is the product of our nervous and endocrine systems (Coppen 1967. Serotonin hypothesis and use of SSRI’s) See p54 study guide (Baumgartner et al 2008 The role of oxytocin in trust in economic behavior) See BLOA physiology and behavior notes.
* Animal research is relevant to behavior (Rosenzweig and Bennett Brain plasticity) See your own BLOA physiology and behavior notes.
* Explain how principles that define the BLOA may be demonstrated in research Possible essay alert

Very similar to the above. You must clearly link the principle to a research study rather than theory.

* Discuss how and why particular research methods are used at the BLOA (ERQ Nov 2011)

*From the mark scheme (delete when read)*

* Research methods used at the biological level of analysis could include experiments, case studies, observations, correlational studies and the use of technology to investigate the biological factors, *e.g.* neuro-imaging.
* Though examples of animal research may be discussed, the use of animals in and of itself is not a research method.
* Discussion about *how* the method is used might refer to key features of the method as well as how the method was used in specific research. For example, experimental studies may identify the sampling and allocation procedures, the independent and dependent variables, and the way in which extraneous variables were controlled.
* Discussion about *why* the method is used might refer to the appropriateness of the method for the aim, issues of validity and reliability, sample choice and size, ease and cost of the procedure, and the generalizability of findings. Candidates may address the strengths of the method as well as how it reflects the principles of the biological level of analysis, *i.e.* candidates could make clear how the selected research methods underpin one or more principles of the level of analysis.
* Responses should focus on the research methods used in the studies cited, not on the studies themselves, *e.g.* a discussion of the results of studies.

Possible ERQ Outline

Introduction: General regarding a variety of research methods used in BLOA

Point 1: Laboratory experiments See p3 of the study guide

Description-Takes place in a lab

How-IV manipulated and the DV measured. All other variables controlled. Controlled environment and standardized procedures.

Why (also strengths)-establishes a cause and effect relationship. Objective. Replicable.

Weaknesses: Behaviour tested in artificial environment so lacks ecological validity. Results may be biased due to demand characteristics or experimenter effects. Sometimes deception is necessary.

Example: Rosenzweig and Bennett Brain plasticity

Point 2: Case studies See p158 of the study guide

Description In depth study of an individual the ‘case’. Idiographic or unique phenomena are explored. Its purpose is to describe, explain and understand psychological phenomena, often from the perspective of the participant.

How Usually a range of quantitative tests are carried out, perhaps using laboratory experiments or brain imaging. In addition a range of qualitative data is carried out. An individual may be observed in their own environment.

Why (also strengths) Often the only way to study very rare behaviours. In depth method which may collect data ignored by other methods. Issues may be complex or sensitive and not appropriate for other forms of research like lab experiments. High ecological validity. Case studies may generate new knowledge or contradict current theory.

Weaknesses No cause and effect can be established. Can’t generalize findings to the population as samples are not representative. Low reliability if recall of past events is involved. Difficult to replicate. Time consuming and expensive. Researcher bias may be an issue as they work very closely with the ‘case’.

Example The case study of HM

Point 3: Correlational studies ie Twin studies See textbook p52

Description Measures the relationship between two or more variables. There is no manipulation of an IV so no cause and effect can be established. To establish a correlation between a behavior and genetic inheritance, twin studies are used. Monozygotic twins (MZ) come from one fertilized egg which split therefore they are genetically identical (share 100% genetic material). Dizygotic twins (DZ) come from two different fertilized eggs and therefore are like siblings who share 50% of their genetic material.

How A behavior is chosen, for example Major Depressive disorder (MDD) and the rate at which the behavior is found in both twins is measured. This usually expressed as a % and is called the **concordance** rate.

Why (also strengths) It can easily quantify observational data. No manipulation of behavior is required. Strong correlations can indicate areas for further research.

Weaknesses No cause and effect can be inferred

Example Nurnberger and Gershon (1982) review of 7 twin studies on major depression

Point 4 Brain imaging technology See study guide p13

Description Used to investigate the relationship between brain structure and behavior.

How There are various techniques. EEG registers patterns of voltage in the brain and therefore provide a readout of what is sometimes called ‘brainwaves’. MRI (Magnetic resonance imaging) provides detailed pictures of internal structures of the body. Shows blood flow in the brain and can identify problems with circulation. They are safe to use.

Why (also strengths) It specifically aims to understand the relationship between biological factors and behavior.

Weaknesses Expensive, no cause and effect relationship can be established. EEG’s only provide limited information. It is not possible to reveal what is happening in the deeper brain or show actual functioning. Lack of ecological validity as scanner is not natural environment for everyday functioning.

Example

EEG-Davidson et al (2004) Brain waves p12 study guide OR Leuchter et al Changes in brain function during treatment with placebo p63 study guide

MRI Bremner et al 2003 Stress and PTSD p11 study guide OR Corkin et al (1997) The case study of HM p 7 study guide

Point 5 Meta analysis using Sullivan et al (2000) See study guide p54. **Meta-analysis** is a statistical technique in which the results of two or more studies are mathematically combined in order to improve the reliability of the results. Studies chosen for inclusion in a meta-analysis must be sufficiently similar in a number of characteristics in order to accurately combine their results.

Advantages of meta-analysis include:

* Combines all the research on one topic into one large study with many participants therefore allows for generalization to the population of studies.
* Ability to control for between-study variation
* Including moderators to explain variation

Weaknesses of Meta Analysis

* Sources of bias are not controlled by the method
* A good meta-analysis of badly designed studies will still result in bad statistics.
* Dangers of Agenda Driven Bias: From an integrity perspective, researchers with a bias should avoid meta-analysis and use a less abuse-prone (or independent) form of research

Point 6 Gene mapping using Caspi et al 2003. Attempts to determine the effect of a particular gene on behavior.

Conclusion: Something general, perhaps indicating that this perspective favours the scientific approach to research.

* Discuss ethical considerations related to research studies at the BLOA Possible essay alert

Introduction: Outline possible ethical considerations that should be considered in research. See p5 of the study guide. PICWDD’S

Specific research will be highlighted to explore ethical considerations in BLOA

Point 1 Use of animals in research.

**Rosenzweig and Bennett 1972** Brain Plasticity Use p10 study guide and p46 of Textbook.

Rats were killed so brain anatomy could be studied. Is the use of animals justified by the findings? Yes since the results contributed to our understanding of brain plasticity. Animal rights are well controlled (see p5 of study guide) and use of animals in experiments is largely justified.

Point 2 Gene Mapping.

**Caspi et al 2003** p14 study guide.

Knowledge about the role of specific genes is still limited so researchers should avoid making definite conclusions. Findings could be misused like they were with the eugenics movement. It could happen again according to **Wallace 2004.** Genetic research could result in stigmatization of individuals with a particular gene. Participant’s access to medical insurance and employment could be compromised because of genetic data. Genetic information can reveal information that is unexpected and a source of distress to a participant (for example of a predisposition for a disorder is found). This is a new area that will develop and strict controls will have to be enforced.

Point 3 Correlation studies on Twins and family

**Nurnberger and Gershon (1982)** review of 7 twin studies on major depression

Genetic research is correlational so researchers should be careful about making definite conclusions about the risk of developing a disease. It is more difficult to ensure anonymity and confidentiality in twin studies and family studies, particularly those that investigate rare disorders.

Point 4 The case study of **HM** p 7 study guide **and** Phineas Gage by Dr John Harlow. P42 Textbook

Phineas Gage had no confidentiality.

HM was given anonymity and identified by his initials only. HM was not able to remember all the times he participated in research so could not give fully informed consent. The important findings of the study justify this.

Linking this to brain imaging technology in general, should people who have their brain scanned be told of any suspected abnormality? This cause unnecessary psychological harm?

Conclusion There are many ethical considerations. Most of which are now controlled by strict guidelines. For example use of animals and anonymity of participants in case studies. Perhaps with the development of Gene mapping this will be a particular cause of concern in the future as it will take time to enforce suitable guidelines.