

OXFORD IB PREPARED



PSYCHOLOGY



ANSWERS



IB DIPLOMA PROGRAMME

OXFORD

Paper 1 (HL)

Section A

Biological approach to behaviour

1. Explain how one neurotransmitter may influence one human behaviour. [9]

The command term “explain” requires students to give a detailed account including reasons or causes. The focus of the response should be on how a neurotransmitter affects behaviour, not on how neurotransmitters work from the biological point of view.

Examples of a neurotransmitter and its effects on behaviour may include, but are not limited to: effects of serotonin on prosocial behaviour, effects of dopamine on motor functions and effects of acetylcholine on memory. Other neurotransmitters and types of behaviour are equally acceptable.

Although animal research may be useful in gathering evidence of the effects of neurotransmission on behaviour, it is important to remember that the question is specifically about human behaviour. Therefore, it is preferable for students to select research with humans to support their answer. If an animal study is used instead, students must clearly and explicitly explain how the findings can be applied to understanding human behaviour.

In the case of one and the same chemical being able to function both as a neurotransmitter and a hormone (for example, noradrenaline), it must be made clear in the response that what is being explained is the function of a neurotransmitter. Accordingly, research that is used to support the answer must investigate this chemical as a neurotransmitter and not a hormone.

If the effect of a hormone is explained instead of the effect of a neurotransmitter, no marks should be awarded for the answer.

Cognitive approach to behaviour

2. With reference to a study investigating one cognitive process, outline the research method used in the study. [9]

The command term “outline” requires students to give a brief account or summary. The focus of the question is on the method used in a research study.

Students are required to use a research study investigating a cognitive process (such as memory, thinking or decision-making), but the question is **not** about the cognitive process per se. It is an instance of generic questions about research and ethics that can be applied to all topics in the core of the syllabus.

It is acceptable for students to select a study that uses one of the methods of research in psychology: experiment, correlational study, survey, interview, observation or case study. It is desirable for students to identify the method more specifically (for example, a true laboratory experiment or a semi-structured interview). If the focus of the response is on a technique that is **not** a research method (such as a brain scanning technique), no marks should be awarded.

Most research investigating cognitive processes is likely to be quantitative (experiments or correlational studies), but qualitative research methods are equally acceptable if the aim of the study is to investigate a cognitive process. For example, the case study of HM (Henry Molaison) would be relevant because it sheds light on the nature of short-term memory and long-term memory as two separate memory stores.

In identifying and outlining the research method, students are expected to provide key characteristics of the method that make it different from other methods of research in psychology. This should be contextualized. For example, if the student claims that the independent variable in an experiment is manipulated by the researcher, it is expected that the student will identify the independent variable that was used in the chosen study and describe exactly how it was manipulated.

Sociocultural approach to behaviour

3. Describe one research study related to acculturation. [9]

The command term “describe” in this question requires students to give a detailed account of a research study.

Examples of research studies that may be used in response to this question include (but are not limited to):

- Shah *et al* (2015): a study showing that acculturation contributes to unhealthy eating because migrants typically move into a culture that promotes less healthy eating behaviours than their own culture
- Ishizawa and Jones (2016): a study demonstrating that there are some protective factors that can serve as a buffer against developing obesity in migrants
- Miranda and Matheny (2000): a study of acculturation stress among Latino immigrants in the USA
- Lueck and Wilson (2010): a study of factors of acculturation stress among Asian immigrants
- Nap *et al* (2014): a study of the influence of acculturation on mental health among immigrants in the Netherlands.

Describing a research study implies demonstrating clear and detailed knowledge of its aim, method, procedure, findings and conclusions. Evaluation of the study is not necessary and will not be awarded any marks.

Since the question specifically asks about a research study, describing Berry’s (1997) theoretical model of acculturation strategies will not be appropriate.

SECTION B

Biological approach to behaviour

4. Discuss how one or more genes may influence behaviour. [22]

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

This question relates to the content heading “Genes and their effects on behaviour”, which is not to be confused with the content heading “Genetic similarity”. Responses here must be focused on particular genes. Research studies used to support the answer are relevant if they employ methods of molecular genetics or epigenetics such as gene mapping. Twin, adoption and family studies are not acceptable for this question, unless the activity of specific genes was also measured in these studies and correlated with behaviour.

If the answer is focused on the concept of genetic heritability of behaviour and supported by research based on genetic similarity (such as twin and kinship studies), up to 1 mark should be

awarded for criterion A (“Focus on the question”), and a maximum of 2 marks should be awarded for criterion C (“Use of research to support answer”).

Research investigating changes in behaviour resulting from epigenetic changes is also relevant, but the specific gene where epigenetic changes occurred must be identified. In this case the discussion will still be concerned with the behavioural effects of a particular gene, simply its expression rather than its presence.

The arguments related to the discussion of the influence of particular genes on behaviour may include (but are not limited to) the following.

- Such research has become possible only recently with the development of gene mapping technology – this is an example of how the available technology determines the nature of knowledge we may have about behaviour.
- The presence of a genetic variant that is known to be responsible for a particular behaviour is not in itself sufficient to be certain that the behaviour will occur. Genes only create a predisposition that must be triggered by environmental or other influences. Additionally, genes may or may not be expressed, which also depends on environmental factors acting through epigenetic mechanisms.
- A limitation of research with human subjects in this area is that genetic material cannot be manipulated in humans. This limits researchers to correlational and quasi-experimental evidence. Such research may be done on animal models (for example, gene knockout models), but this is subject to ethical considerations. Additionally, generalizability from animal studies is questionable.

Research studies that may be used in the response include (but are not limited to) the following examples.

- Caspi *et al* (2003): a study showing that 5-HTT (the serotonin transporter gene) may be responsible for vulnerability to stressful life situations. Bearers of short alleles of this gene react with more stress to the same life events, and therefore are more likely to develop depression.
- Ferguson *et al* (2000): a study with oxytocin gene knockout mice models. The study found that “switching off” the oxytocin gene in mice leads to inhibited social memory.
- Weaver *et al* (2004): a study showing that nurturing behaviours of rat mothers may be responsible for epigenetic changes in the glucocorticoid receptor gene of their offspring, increasing their vulnerability to stress later in life. The study also found that these epigenetic changes are chemically reversible.
- Kaminsky *et al* (2008): a case study of two identical twins. Epigenetic mapping showed significant differences in the epigenetic expression of one gene (DLX1), and this was hypothesized to be responsible for the twins’ drastically different lifestyles.

Cognitive approach to behaviour

5. Evaluate one or more models of thinking and/or decision-making.

[22]

The command term “evaluate” requires students to make an appraisal by weighing up the strengths and limitations.

The theories of thinking and decision-making that students may choose to evaluate include (but are not limited to):

- the theory of reasoned action (TRA)
- the theory of planned behaviour (TPB) by Ajzen (1985)
- the adaptive decision-maker framework by Payne, Bettman and Johnson (1993).

Students may choose to evaluate one theory of thinking and decision-making and make a more thorough evaluation, or choose two or more theories so that the evaluation includes some comparison between models, bringing out their relative strengths and limitations.

In evaluating a model of thinking, students may use evaluation points such as:

- explanatory power of the model (the range of phenomena that can potentially be explained with it)
- parsimoniousness of the model (explanatory power in relation to the complexity of the model)
- a range of empirical predictions that can be formulated based on the model
- empirical support for these predictions
- quality of research that supports the model (for example, meta-analyses)
- areas of applicability
- potential biases.

(This list is neither prescriptive nor exhaustive.)

Empirical evidence should be used in the response as part of the evaluation.

For example, the following supporting studies may be considered.

- Albarracín *et al* (2001): a study investigating predictive validity of the theory of planned behaviour in the domain of condom use.
- Collins, Witkiewitz and Larimer (2011): a study investigating the theory of planned behaviour as a predictor of risky drinking among college students.
- Luce, Bettman and Payne (1997): a study that provided support to the adaptive decision-maker framework. The study demonstrated that in an emotionally pressing situation, people tend to process information more extensively, but at the same time avoid emotionally difficult trade-offs.
- Woods *et al* (2005): a study investigating age differences in processing emotional information, designed in line with the adaptive decision-maker framework. The study used the Iowa Gambling Task to examine the integration of emotion and cognition in risky decision-making.

Focus on the requirements of the command term is important. While certain findings of research studies and details of the models themselves may be demonstrated, only those details that are directly relevant to evaluation points should be used.

Sociocultural approach to behaviour

6. Discuss the effect of the interaction of global and local influences on behaviour. [22]

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence. This is an HL extension question. Students can use content from various parts of the course (predominantly Sociocultural approach to behaviour) to uncover the main relationship stated in the question – that global factors and local factors interact in their influence on individual behaviour.

Many theories and research studies that students cover in the course focus on the influence of local culture on behaviour. One example of this is social cognitive theory. Bandura’s experiments provide evidence to the idea that individual behaviour may change through observational learning. Since most of the models are “local” (parents, peers), this may be an argument for local influences.

However, observational learning may be the mechanism of global influences too (for example, mass media).

A special body of research looks at global influences and focuses on how globalization processes end up affecting the behaviour of individuals. This research almost inevitably includes some comparison of global and local influences. Examples of theories and research studies that could be used here include (but are not limited to) the following.

- Berry (1997): two-dimensional model of acculturation. This applies to globalization if you define it as acculturation to the “global culture”.
- Berry (2008): on possible outcomes of globalization, in accordance with his two-dimensional model.
- Kim and Omizo (2006): a study showing how enculturation can interact with acculturation to influence identity.
- Buchan *et al* (2009): a study of globalization and cooperation. This study supports the hypothesis that globalization strengthens people’s cosmopolitan attitudes by weakening their identification with their group of origin.
- Adams (2003): a study on the convergence of cultural values between the USA and Canada over time. It showed that globalization is not necessarily a straightforward process in which the dominant (global) culture subsumes non-dominant cultures, and that the outcomes of globalization depend on the acculturation strategy chosen. This outcome will take the form of one of the possible outcomes of the interaction between the global and the local.
- Ogihara and Uchida (2014): a study of the effects of working in a globalized workplace environment on the subjective well-being of Japanese participants who come from collectivistic backgrounds.

Although students can use a variety of content to support their response, their arguments should clearly identify which of the influences are local and which are global, and the response should be focused on the interaction between them.

Phenomena highlighting the process of interaction between global and local influences on behaviour include (but are not limited to) the following examples.

- Globalization increases an individual’s exposure to other cultures, some of which dominate others. This leads to an inevitable clash between norms of the local culture and norms of the globalized world, especially in cultures with strong traditional values. The two sets of norms interact with each other, resulting in one of several possible outcomes (Berry 2008). The outcome may depend on the relative strength of the two sets of norms.
- Globalization increasingly causes people to identify not only with their local cultural group, but also with the world as a whole (cosmopolitan attitudes). Cosmopolitan attitudes may mediate the effects of social identity and influence behaviours associated with ingroup favouritism and outgroup discrimination, as shown for example in Buchan *et al* (2009).
- On the other hand, local cultural identity may counteract the pressure of globalization by reinforcing the local cultural distinctiveness. This may result in a divergence of cultural values despite increasing interconnectedness (Berry 2008; Adams 2003).
- As the scale of globalization increases, individuals do not simply abandon their local culture and assimilate the new global cultural values. Their local culture will continue to exert an influence. This sometimes results in identity confusion. New behaviours and cultural syndromes may emerge due to conflict between the local culture and new social media or a globalized workplace environment (for example, Ogihara, Uchida 2014).

Paper 2 (HL)

Abnormal psychology

1. Evaluate one or more research methods used to investigate factors influencing diagnosis.

The command term “evaluate” requires students to make an appraisal by weighing up strengths and limitations. The syllabus topic “Factors influencing diagnosis” includes the content headings:

- Normality versus abnormality
- Classification systems
- The role of clinical biases in diagnosis
- Validity and reliability of diagnosis.

Students may choose to evaluate one research method in greater detail or more than one method in less detail. Both approaches are equally acceptable, and students should select the approach that maximizes the focus on the requirements of the question. It is advisable that students select research methods from the general list in the Subject Guide: experiment, correlational study, survey, observation, interview and case study. If a student evaluates, for example, field experiments and laboratory experiments, this should not be considered as two separate research methods. However, this will not have an effect on assessment because one research method is acceptable in response to this question.

It is important that the arguments made and the examples given come from the appropriate content heading for the topic “Factors influencing diagnosis”. They should all be related to diagnosis. If a student uses supporting arguments or research studies relevant to other topics (for example, treatment of disorders), these should not be awarded marks.

The focus of the response should be on **research methods** used to investigate factors influencing diagnosis (that is, experiments, correlational studies and so on), rather than the factors influencing diagnosis themselves.

The most effective responses will evaluate not only specific examples of research, but also strengths and limitations of a research method in this area of research in general. For example, it may be claimed that the assessment of reliability of diagnosis should be performed under naturalistic conditions with real-life patients and clinicians in real-life circumstances, but this makes it impossible to use experiments, leaving correlational studies as the only alternative. This argument is related to the area of research in general, rather than an individual study.

Research methods and studies that can be used in a response include (but are not limited to) the following examples.

- Studies of inter-rater reliability in diagnosis (which can be categorized as correlational studies). These include Beck *et al* (1962), Williams *et al* (1992) and Regier *et al* (2013).
- Systematic experimental research into the role of clinical biases in diagnosis. In some studies the independent variable was manipulated by the researchers, making the study experimental – Payne (2012) and Chapman and Chapman (1969). Other studies used a pre-existing difference as the independent variable, making them quasi-experimental – Furnham and Malik (1994) and Lin, Carter and Kleimman (1985).
- Qualitative methods such as the interview, used to gain a deeper insight into the nature of patients’ and clinicians’ experiences in the process of diagnosis. For example, elements of interview were used by Langwieler and Linden (1993), and elements of observation were used by Rosenhan (1973).

2. Contrast two explanations for one mental disorder.

The command term “contrast” requires students to give an account of the difference between two (or more) items or situations, referring to both (all) of them throughout. Strong responses will focus on contrasting two explanations rather than providing separate accounts of them. To gain full marks, responses will outline the main points of difference, then contrast the explanations against these points. Speaking about similarities is not required. Some points of difference that could be mentioned include (but are not limited to) the following.

Differences between biological explanations and cognitive explanations include these points.

- Beliefs about the leading etiology. For biological explanations, disorders are caused by genetic and physiological factors. For cognitive explanations, disorders are caused by thinking patterns.
- Empirical support. Biological explanations have limited experimental evidence with humans: manipulating genetic and physiological variables in humans is unethical, whereas animal research is limited in generalizability. Therefore, biological explanations rely to a large extent on evidence from quasi-experiments and correlational studies. On the other hand, it is easier to obtain experimental evidence when testing potential effects of cognitive variables on a disorder.
- Predisposition and mediating variables. Biological factors are usually seen as a predisposition in the development of a disorder. Whether or not this predisposition manifests in a disorder depends on the presence of mediating variables. Cognitive factors are commonly seen as such mediating variables.

Differences between cognitive explanations and sociocultural explanations include these points.

- Beliefs about the leading etiology. For cognitive explanations, the leading cause of mental disorders is patterns of thinking or information processing. For sociocultural explanations, the leading factor is the collection of all environmental triggers, such as unemployment or poverty status. While neither of the approaches can provide definitive support that one group of factors is superior to the other, they build their research on such assumptions.
- Controllability. Cognitive factors are more controllable by the patient than sociocultural factors, and so cognitive explanations of disorders allow for the possibility of treatment. Studies on the effectiveness of cognitive treatment may be used as evidence to support the validity of cognitive explanations. On the other hand, sociocultural explanations of disorders imply that mental disorders should be dealt with by social interventions. This means that research evidence of effectiveness cannot come from individuals, only from large groups.
- Group influences. Cognitive explanations may ignore an important dimension of psychological functioning – the fact that individuals live in groups and are influenced by these groups. On the other hand, sociocultural explanations may ignore the fact that environmental factors do not influence individual behaviour directly, only through a number of mediating cognitive variables.

If a student discusses explanations of more than one disorder, only one disorder should be given credit when awarding marks. If a student discusses more than two explanations of a disorder, only two of these explanations should be given credit when awarding marks. If a student discusses explanations of a disorder separately without explicitly contrasting them, no marks should be awarded for criterion A (“Focus on the question”), and a maximum of 2 marks should be awarded for criterion D (“Evidence of critical thinking”).

Supporting research will depend on the explanations and the disorder chosen by the student. Using major depressive disorder (MDD) as an example, studies include (but are not limited to):

- biological explanations: Sullivan, Neale and Kendler (2000), Kendler *et al* (2006), Silberg *et al* (1999), Caspi *et al* (2003)

- cognitive explanations: Beck (1967), Alloy, Abramson and Francis (1999), Caseras *et al* (2007), Hammen and Krantz (1976)
- sociocultural explanations: Brown and Harris (1978), Rosenquist, Fowler and Christakis (2011).

3. To what extent can the effectiveness of treatment of mental disorders be assessed?

The command term “to what extent” requires students to consider the merits or otherwise of an argument or concept. Opinions and conclusions should be presented clearly and supported with appropriate evidence and sound argument.

Students should appreciate that assessing the effectiveness of treatment is not an easy task, and responses should reflect this understanding. It is acceptable to discuss various aspects related to the problem of assessing effectiveness, such as the research methods that can be used, the confounding variables that are difficult to eliminate, the many existing outcome variables and the uncertainty surrounding decisions about which one to use. It is important for the answer to be focused on the problem of assessing effectiveness of treatment rather than discussing whether or not certain treatments are effective.

Relevant arguments and conceptual understandings may include (but are not limited to) the following.

- The severity of a disorder is an important consideration in research into the effectiveness of treatment, because a treatment that is effective for a mild disorder can prove to be ineffective for the same disorder when it has taken a more severe form. This complicates assessments of effectiveness, making it less straightforward.
- Another consideration that complicates assessment of the effectiveness of treatment is the difference between short-term effects and long-term effects. Some treatments are effective in the short term but not in the long term, and vice versa.
- There are multiple treatment outcomes that could potentially be used in assessing the effectiveness of treatment, but there is no simple way to prefer one outcome to the others. For example, a treatment may result in a considerable reduction of symptoms (response rate), but symptoms may be likely to return when the treatment is discontinued (relapse rate). Sometimes a low relapse rate may be preferable to a high response rate. In other cases, such as suicidal ideations, this does not apply.
- A challenge in assessing the effectiveness of treatment is separating the treatment effects from placebo effects. Treatment can be considered effective only if it outperforms placebo. But such separation is possible only in carefully controlled randomized trials (experiments), which are not always possible in a clinical setting. They are also especially challenging with non-medical treatments.

Relevant research studies that can be used in support of the arguments include (but are not limited to) the following.

- Any research demonstrating that estimates of effectiveness of a treatment differ depending on the treatment outcome (short term versus long term) or other factors. For example, Hollon *et al* (2002) investigated the effectiveness of antidepressants for weak, moderate and severe depression. TADS (the “Treatment of Adolescents with Depression Study”) compared the effectiveness of antidepressants versus non-medication treatment in the short term and in the long term.
- Research investigating the role of specific versus non-specific factors in treatment through comparing the effectiveness of various psychotherapeutic approaches. For example, Eysenck (1952) compared the effectiveness of different non-medical treatments. Smith and Glass (1977) conducted a meta-analysis to find out whether different treatments systematically vary in effectiveness.

Developmental psychology

4. To what extent do peers and/or play affect cognitive and/or social development?

The command term “to what extent” requires students to consider the merits or otherwise of an argument or concept. Opinions and conclusions should be presented clearly and supported with appropriate evidence and sound argument.

The content heading that this question addresses is “Role of peers and play”, and it comes under the topic “Influences on cognitive and social development”. Play with peers is one of the forms that peer influence may take.

When speaking about the significance of peers for cognitive development, students may (but are not required to) focus on the following.

- The existence of two opposing theoretical perspectives in this area: Piaget (1932) and Vygotsky (1978). According to the former, peers are more important than adults; the theory emphasizes the role of perspective-taking and overcoming the emerging discrepancies in perspectives. According to the latter, adults are more important than peers; the theory emphasizes the role of interaction with a more knowledgeable other.
- Supporting evidence for both perspectives. For example:
 - Damon and Killen (1982): a study comparing how moral perspectives may speed up the development of moral reasoning
 - Nedospasova (1985): a study showing children who played with a more knowledgeable other performed better on the three mountains task.

When speaking about the significance of peers for social development, research studies that can be used include (but are not limited to):

- Suomi and Harlow (1975): an animal study investigating effects of social deprivation
- Hollos and Cowan (1973): a study of children who grew up without same-age peers (and their social skills)
- Roff (1963): a retrospective analysis of peer adjustment in early childhood for socially disordered adults
- Coie and Dodge (1988): an observational study investigating the role of peer status in development.

When speaking about the significance of play, students may address different forms of play and the key stages in its development. The focus should be on demonstrating how engaging in various forms of play affects development. To some extent, this aspect will overlap with the effect of peers (since much of play is play with peers), although research into earlier forms of play demonstrates that play without peers also has a significant role in cognitive development.

Students may choose to focus on only cognitive or only social development, or they may speak about both. Both approaches are equally acceptable. Similarly, students may choose to focus only on the role of peers or only on the role of play, or they may speak about both. To fully address the requirements of the command term, students should consider arguments and counter-arguments for each of the claims, not just use arguments from a different domain as a counter-argument. For example, if the claim is “peers have a large influence on social development”, then “peers have little influence on social development” (supported by research) is a good counter-claim, but “parents also have an influence on social development” is not.

5. Discuss biological, cognitive and/or sociocultural influences on the development of identity.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

This question is an example of a general question (based on the three approaches to understanding behaviour) that is applied to one of the groups of topics within an option (in this case, the question is applied to the topic “Developing an identity”). The content headings under the topic “Developing an identity” are:

- Attachment
- Gender identity and social roles
- Development of empathy and theory of mind.

This means that students can draw content from these headings to answer the question.

The topic that lends itself most naturally to the investigation through the three approaches to behaviour (biological, cognitive and sociocultural) is probably gender identity. Students may choose gender identity specifically as an example of focus. (It is equally acceptable to use content from the other headings provided that students find relevant arguments and supporting studies.)

Within gender identity, theories and research that may be used include (but are not limited to) the following.

Biological approach to behaviour – research includes:

- studies of sex-determining hormones, such as Goy and McEwan (1980)
- evolutionary explanations of gender differences
- case studies of anomalies in biological sex resulting in differences in gender-related behaviour (such as Imperato-McGinley *et al* (1974) – the Batista family case study; and Money and Erhard (1972) – the case study of David Reimer)

Cognitive approach to behaviour – research includes:

- cognitive developmental theory (Kohlberg 1966)
- gender schema theory (Bem 1981)
- Martin and Halverson (1981): a study of gender labelling
- Fagot and Leinbach (1989): a study of parental influence on children’s gender labelling.

Sociocultural approach to behaviour – research includes:

- Bandura (1977): on gender socialization by parents
- Smith and Lloyd (1978): a series of “baby X” studies
- Maccoby (1990), Draper and Cashdan (1988), Sroufe *et al* (1993): research into gender socialization by peers
- Whiting and Edwards (1973): a study demonstrating cross-cultural differences in gender socialization as a result of economic variables
- Silva *et al* (1992): a study of gender identity in the age of globalization among Sri Lankan teenagers
- Woods *et al* (2002): a study investigating which toys adult participants selected when playing with boys as opposed to girls.

Students do not have to focus on all three approaches to behaviour. They can choose one, any combination of two, or all three approaches. In writing their responses, students may use the depth approach (for example, unpacking arguments or counter-arguments related to one factor influencing gender identity); the breadth approach (for example, covering a large number of factors potentially influencing gender identity); or a combination of the two. However, some elements of the depth approach are required to score high marks on criterion C ("Use of research to support answer").

To gain maximum marks for the discussion of various influences on the development of identity, students should go beyond simply stating that these influences exist. Discussion points may include (but are not limited to):

- recognizing limitations of empirical studies in making theoretical generalizations
- ethical considerations involved in determining the effect of various factors on the development of identity
- research difficulties related to cultural variations in the development of identity
- the necessity of a holistic approach to understanding behaviour that combines all factors of influence
- complex interactions between biological, cognitive and sociocultural variables in determining human behaviour.

6. Evaluate psychological research into cognitive development.

The command term "evaluate" requires students to make an appraisal by weighing up strengths and limitations.

Most typically, teaching of cognitive development is organized around theories of cognitive development, such as those of Piaget and Vygotsky. It is acceptable to focus the essay on psychological research supporting these theories. However, it is important that the evaluation in the essay is focused on research and not the theory itself. (This is in contrast to the question "Evaluate theories of cognitive development".)

Strong responses will relate evaluation points to the broader context of the research area. This is in contrast to evaluating individual studies. For example, weaker responses may claim that a particular study may be weak in terms of its control of confounding variables. However, stronger responses will go beyond that and claim, for example, that a lack of control over confounding variables is typical for research into cognitive development because most of this research must happen in a natural process of interaction between a child and the experimenter.

Some general arguments regarding research in the area of cognitive development include (but are not limited to) the following.

- Research in this area is sensitive to artifacts (findings that result from characteristics of the research setting rather than genuine characteristics of a child's cognitive development). Many research tasks involve an interview or an interaction between a child and a researcher, and various characteristics of this interaction (such as the exact wording of a question) may have a great influence on the outcome.
- Testing the hypothesis about biological maturation as the leading factor of cognitive development has an essential limitation: it is impossible to manipulate biological variables in an ethical research study. For this reason, all we can do is establish a correspondence between cognitive development and age (assuming that with age comes the maturation of brain structures).
- Similarly, the hypothesis that sociocultural influences (such as education) are the leading factor of cognitive development cannot be empirically tested in its entirety. Researchers operationalize sociocultural influences in a narrow aspect and test how this affects

performance on a number of cognitive tasks. However, generalizing these results to the conclusion that culture is the leading cause of development is a big leap.

Examples of research studies that could be used to support the answer include (but are not limited to):

- Damon and Killen (1982): a study on cognitive development in interaction with other peers
- Piaget and Inhelder (1956): a demonstration of the phenomenon of cognitive egocentrism through the use of the three mountains task
- Borke (1975): a study demonstrating that a change in instruction can lead to a different result in the assessment of cognitive egocentrism in children
- Nedospasova (1985): a study on cognitive egocentrism in children who interact with an adult

If the response is focused on evaluating theories of cognitive development rather than psychological research around them, a maximum of 3 marks should be awarded for criterion D (“Evidence of critical thinking”). Up to full marks may be awarded for other assessment criteria.

Health psychology

7. Discuss the biopsychosocial model of health and well-being.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

The biopsychosocial (BPS) model of health and well-being views health as a phenomenon that is multi-determined by biological, cognitive and sociocultural factors. This model was a reaction to the reductionist medical model of illness, which assumed that for every illness there is an identifiable biological cause and once the cause is eliminated, the illness will be treated. The BPS model is therefore holistic in that it accepts the idea of health being influenced by a variety of factors.

Strong responses, however, will go beyond this claim. Additional arguments that may be considered in relation to this model of health include (but are not limited to) the following.

- The three groups of influences interact with each other. Not only do they influence health, they also influence each other. For example, cognitive interpretations of an illness and its symptoms may lead to psychosomatic phenomena and therefore influence biological variables (for example, anxiety reduces the strength of the immune system). Lack of self-efficacy (such as in obesity) will affect lifestyle (such as exercising), which in turn may affect the body. Social factors such as the availability and popularity of cheap food with lots of added sugar may lead to underestimating the risks associated with consuming such food and, through this cognitive variable, it will affect the body.
- The BPS model places great importance on the idea of lifestyle influencing health-related behaviour. Therefore it places greater responsibility on people for their own health as compared to the medical model. This is reflected in the focus of the research, which has shifted from symptoms of illness to broader characteristics of health-related behaviours.
- The BPS model is very general (intentionally so) to reflect the holistic nature of health. But the more general a model is, the less it is possible to test it in its entirety in empirical research. For this reason, existing research evidence provides indirect support to the BPS model rather than directly testing it.

Supporting research evidence for the model comes from at least two major sources.

The first one of these is evidence of biological, cognitive and sociocultural factors influencing health behaviour. Students can use a variety of research studies to illustrate this point, for example:

- Haworth *et al* (2018): a study on genetic predisposition to obesity
- DelParigi *et al* (2005): a study on patterns of brain activation in response to food stimuli in obese individuals
- Deshpande, Basil and Basil (2009): a study on the predictive validity of the health belief model, investigating the importance of cognitive variables in predicting health-related behaviour
- Padez *et al* (2005): a study on family variables as social factors affecting the risk of obesity
- Chaput (2009): the “Quebec Family Study” investigating multiple, interacting social risk and protective factors of obesity.

It is important, however, that the answer does not become enumerative and does not simply list possible factors affecting health. Clear links must be made to the BPS model and challenges associated with it.

The second source of evidence that students may use is evidence from studies that employ holistic treatments and compare their effectiveness to traditional models of treatment targeting a limited number of factors. For example, Nguyen *et al* (2017) investigated the effectiveness of the biopsychosocial approach to the treatment of obesity (in contrast to more traditional approaches). Students can use any other relevant research.

8. Discuss ethical considerations relevant in the study of health problems.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

This is a generic question formulated with a focus on the topic “Health problems”.

This topic includes the content headings:

- Explanations of health problem(s)
- Prevalence rates of health problem(s).

Ethical considerations can be organized into three broad groups: ethical considerations in conducting a study, in reporting its results and in applying its findings. Students may (but are not required to) mention arguments from each of these groups. Ethical considerations discussed by students do not have to be equally distributed among the three groups either, but relevance to the question is important.

To keep the answer focused, ethical considerations discussed by students should be clearly related to research on either explanations of health problems or prevalence rates of health problems. Generic ethical considerations that could be relevant to any research in psychology should not be awarded maximum marks. Strong answers might also go beyond discussing ethical considerations in particular studies to consider ethical considerations characteristic of research in this area on the whole.

Examples of such ethical considerations include (but are not limited to) the following.

- Ensuring confidentiality in both conducting the study and reporting its results is particularly important in this area because questions about health-related behaviours may be sensitive. With topics such as obesity and sexual health, it is important to gain an

insight into participants' beliefs about their health problems, expectations regarding the outcomes of certain behaviours, self-efficacy and so on. These insights may be gained from qualitative studies (interviews) or quantitative research using surveys. In any case, to reduce anxiety and uncomfortable experiences (and to increase the credibility of results), participants must be sure that their identity will not be revealed from their responses.

- Since explanations of health problems are directly linked to health promotion programmes, it is important to observe ethical considerations in the publication and application of results. For example, if a particular research study demonstrates that a particular health problem is strongly influenced by genetic factors, accepting these results as a foundation for health promotion may carry the danger of targeting wrong causes, or even not attempting to make a difference where difference can be made. Researchers must be very clear about the limitations of their findings and the generalizability of results, bearing in mind that blind acceptance of these results as being “true” by policy-makers may lead to sub-optimal health promotion efforts.
- The possibility of incidental findings must be closely monitored in research in this area because they may be traumatic for individuals. For example, in qualitative research of such health problems as stress and sexual health behaviour, details may become known to the researcher that the participant may or may not know.

Supporting research used in student answers will depend on the nature of the ethical considerations discussed. It is important, however, that examples of such research come from relevant content – either explanations of health problems or prevalence rates of health problems. Research from other content headings in Health psychology should not be credited.

9. To what extent are health promotion programmes effective?

The command term “to what extent” requires students to consider the merits or otherwise of an argument or concept. Opinions and conclusions should be presented clearly and supported with appropriate evidence and sound argument.

Multiple health promotion programmes have been designed to address various health problems. Some programmes are designed on the individual level. They target the patterns of health behaviour of individual participants, often taking the form of counselling sessions. Other programmes function on a higher level in an attempt to broaden the scope of their influence. For example, mass media campaigns act on the level of a community. They try to promote healthy lifestyles through advertising. Students may choose any of such approaches (or any combination of them) for their answers. All strategies are equally acceptable.

Strong essays will focus on the problem of the effectiveness of health promotion programmes. This means that main attention should be given not to details of the programmes themselves, but results of research studies exploring their outcomes. Analysing the potential reasons for effectiveness (or lack thereof) of particular promotion programmes is equally relevant. Requirements of the command term will also be effectively addressed if students consider the limits or conditions within which certain health promotion programmes are effective. In any case, strong essays will go beyond a simple conclusion of “to some extent”. They may add specific considerations that have been shown to make health promotion more or less effective, or specific challenges faced by research that is trying to quantify effectiveness of a health promotion programme. Other arguments are also possible and equally acceptable.

Health promotion is closely linked to explanations of health problems. Every health promotion programme targets what is believed to be an underlying cause of the health problem. For this reason, limitations of research establishing a particular cause of a health problem also translate into limitations of effectiveness of a health promotion programme. However, students should be careful to use research that is directly relevant to the question. Simply discussing explanations of health problems with research supporting the influence of various factors (biological, cognitive,

sociocultural) will not be appropriate. Relevant research studies in response to this question should explicitly investigate a specific health promotion programme (or several programmes). Students can also show evidence of critical thinking by evaluating studies with a focus on assessing the effectiveness of health promotion programmes.

Examples of research studies that can be used to support the answer include (but are not limited to):

- Black *et al* (2010): a study investigating the effectiveness of the “Challenge!” health promotion programme
- Langford *et al* (2015): an evaluation of the Health Promoting Schools (HPS) framework
- Craig, Tudor-Locke and Bauman (2006): an investigation of the effectiveness of the “Canada on the Move” programme
- Malterud and Tonstad (2009): on the common challenges in implementing anti-obesity prevention programmes

Psychology of human relationships

10. Discuss the role of communication in personal relationships.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

Responses may include (but are not limited to) the aspects of communication:

- content of communication (ratio between positive and negative communication)
- communication patterns that tend to differ across marital types (interdependent, independent and separate)
- amount of communication
- patterns of accommodation
- attributional styles
- self-disclosure.

Additional points of discussion may include (but are not limited to):

- cultural biases
- difficulties of carrying out research on communication styles
- ethical concerns when conducting research.

Relevant studies and/or theories may include (but are not limited to) the following.

- Social penetration theory (Altman, Taylor, 1973). This theory views a developing relationship as a progressive movement through “layers” of communication, where the key role is given to self-disclosure.
- Studies of self-disclosure (for example, the meta-analysis of Collins *et al* (1994), which have demonstrated that self-disclosure mutually increases liking between the person who disclosed and the person who has been disclosed to.
- Sheldon (2009): a study on the role of self-disclosure in the development of Facebook relationships.
- Attribution theory (Heider 1958). However, the focus here should be not so much on this classical theory as on the idea of attributional styles based upon it.

- Stratton (2003): an observational study of attributional styles in troubled families that sought counselling.
- Gottman and Krokoff (1989): a longitudinal observational study of patterns of accommodation in the communication of couples, and the role of patterns of accommodation in the development of relationships.

Students should not simply describe theories or studies, but show how they help us to better understand the role of communication in maintaining relationships. It is also desirable that students, while discussing the role of communication, highlight various aspects of it as well as the complicated nature of the phenomenon. For example, it can be shown that research has failed to establish clear links along the lines of “the presence of conflict makes relationships weaker”. Depending on how conflict is dealt with in the couple, it may be a positive or a negative experience in maintaining a relationship.

11. Discuss origins of conflict and/or conflict resolution.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

“Conflict” is a broad concept that includes a range of phenomena. Students may explore this breadth, but they also need to be conceptually clear at all times. For example, it would not be appropriate simply to discuss research studies related to competition without explicitly explaining how this links to conflict on a conceptual level.

In discussing origins of conflict, students may consider a number of theories that have pointed to different factors that may serve as origins of conflict. Some of these theories are:

- realistic conflict theory, which states that the major origin of conflict is competition over scarce resources
- social identity theory, which points at the role of merely categorizing people into groups
- the instrumental model of group conflict, which emphasizes a combination of resource stress and the perceived salience of a potentially competitive group.

Students can use supporting research for each of these theories. However, focus on the concept of conflict should be maintained at all times. Conflict may be understood as explicit, escalated competition. For example, in Sherif’s research, competition between groups gradually takes more explicit forms and becomes conflict. In this way, Sherif’s research may be directly relevant to the question. However, in Tajfel’s research the focus is on outgroup discrimination, which is arguably an important prerequisite of conflict behaviour, but not conflict per se. Students must be explicitly clear about that, and this marginal relevance should be reflected in the amount of time they spend discussing the respective studies and theories.

When discussing conflict resolution, theories and research studies that students may use in their response include (but are not limited to):

- contact theory – Allport (1954) – which posits that contact between groups reduces intergroup conflict (provided several conditions are met)
- Pettigrew and Tropp (2006): a meta-analysis that supported contact theory but also highlighted additional aspects, such as the fact that effects of intergroup contact generalize across situations
- Bruneau and Saxe (2012): a study showing that members of the dominant group respond more positively to perspective-taking, while members of the non-dominant groups respond more positively to perspective-giving (expressing themselves and being heard)

- Sherif's studies showing that introduction of superordinate goals leads to a reduction in intergroup conflict
- the Sabido methodology: a model of stimulating positive change in social behaviour through the use of mass media, based on principles of the social learning theory.

Students could also discuss potentially aggravating factors of conflict and how these factors may be targeted in conflict resolution initiatives.

Students may discuss either one of the two aspects (origins of conflict or conflict resolution) or both of them. If students discuss both, these two aspects do not have to be equally balanced.

12. Discuss the use of one or more research methods in the study of social responsibility.

The command term “discuss” requires students to offer a considered and balanced review that includes a range of arguments, factors or hypotheses. Opinions or conclusions should be presented clearly and supported by appropriate evidence.

This is an example of a general question (based on research methods) that is applied to one of the topics within an option. In this case, the question is applied to the topic “Social responsibility”, which consists of the content headings:

- Bystanderism
- Prosocial behaviour
- Promoting prosocial behaviour.

This means students can draw on content from any of these headings to answer the question.

The focus of the response should be on various research methods, not on the findings of research studies per se. Students should discuss how and why one or more research methods are used. The three content units mentioned above provide many examples of research utilizing various methods. Examples include (but are not limited to) the following.

Bystanderism – research includes:

- Latané and Darley (1970): the cognitive model of bystander intervention. (This can be used as a reference point when discussing how a certain research method enables researchers to make certain inferences related to the model.)
- Darley and Latané (1968): the “intercom” study demonstrating diffusion of responsibility.
- Latané and Darley (1968): the “smoke-filled room” study demonstrating pluralistic ignorance.
- Piliavin, Rodin and Piliavin (1969): the “subway” study, demonstrating an arousal-cost-reward model.

Prosocial behaviour – research includes:

- Theories of altruism: kin selection theory (Hamilton 1964), empathy-altruism hypothesis: Batson *et al* (1981).
- Madsen *et al* (2007): a cross-cultural study demonstrating kin selection in human subjects.
- Batson *et al* (1981): the “Elaine” study, demonstrating the influence of induced empathy on altruistic behaviour.

Promoting prosocial behaviour – research includes:

- Nguyen and Parker (2018): analysis of hospital admissions data before and after the adoption of a “Good Samaritan” law
- Flook *et al* (2015): a study demonstrating that a mindfulness-based kindness curriculum for pre-school children makes their behaviour more prosocial
- Hutcherson, Seppala and Gross (2008): a study demonstrating that a brief session of loving-kindness meditation may enhance general positivity toward strangers.

This selection of research studies demonstrates various varieties of the experimental method: laboratory experiments, field experiments, natural experiments and quasi-experiments.

Students should be clear that the key research methods in psychology include experiments, correlational studies, observations, interviews and case studies. Whatever research method is identified, it should be clearly related to one of these categories.

Paper 3 (HL)

1. (a). Identify the research method used in the study and outline two characteristics of the method. [3]

The study described in the stimulus material is an experiment. More specifically, it may be categorized as a true laboratory experiment following the independent measures design. One characteristic of the method is that, unlike all other methods of research, it allows for making cause-effect inferences. This is achieved because the independent variable (compassion training versus memory training) is manipulated by the researcher by means of randomly allocating participants into groups.

Another characteristic of the method is that it is fully quantitative. The observed behaviour (prosocial behaviour towards strangers) is strictly operationalized by the number of times participants donated their “key” in a scripted computer game, and a numerical value is assigned to this behaviour. This allows for quantitative comparisons of behaviour in the two groups, using inferential statistics and, as a result, making inferences that are thought to be applicable to the target population.

Other characteristics can also be outlined in the response, and are equally acceptable if they are relevant and contextually applicable.

One mark is awarded for the correct identification of the research method used in the study. One mark is awarded for each of the characteristics outlined. Each characteristic should be outlined clearly and be relevant to the method.

Note that it may be argued that although researchers clearly meant allocation into groups to be random, it was not fully random, strictly speaking. Participants were allocated into groups based on which slot was available at the time the participant could come. If the time the participant could come was somehow related to prosocial behaviour, then this would become a source of bias and the two groups would not be completely equivalent from the start. Therefore, it might be reasonable to categorize the study as a quasi-experiment. This response is also acceptable if it is explained with reference to group allocation that was not fully random.

1. (b). Describe the sampling method used in the study. [3]

No attempt was made in the study to sample randomly from the target population. Participants were female volunteers recruited via advertisements. This sampling method may be categorized as self-selecting sampling. It would be also acceptable to identify the sampling method as convenience or opportunity sampling because researchers did what was most practical in their situation in terms of saving resources.

Both self-selecting and convenience sampling are non-probability sampling methods that do not guarantee that the sample will be representative of the target population. These methods are preferred when the research is a pilot programme and generalizing to a wider population is not the aim of the study. This applies in the given scenario. Another common reason for using non-probability sampling in quantitative research is dealing with a situation where there are not many reasons to expect that the result will be different from one social group to another. This may also apply in the given scenario.

Relevant details that could be mentioned in the description of the sampling method include the fact that all volunteers were healthy women, that there were 69 participants, and that the rationale behind recruiting only female participants was that they have higher empathy scores.

Marks should be awarded for correctly identifying the sampling method and providing relevant descriptive details of the method.

Responses that confuse the sampling method with the method of group allocation should not be awarded marks. Such will be the case with responses that identify the sampling method as “random” because the division into experimental and control groups was done randomly.

1. (c). Suggest one alternative or one additional research method that could be used to investigate the aim of the original study, giving one reason for your choice. [3]

The aim of the study was to investigate the possibility of promoting prosocial behaviour towards strangers by means of short-term compassion training. This was placed in the context of prior research, which had shown that such short-term training sessions have positive effects on participants’ behaviour in the laboratory, but it remained unclear if these effects endure outside of the laboratory. From this we may conclude that the main focus of the research study was the effects of compassion training on prosocial behaviour in real-life settings.

Since the aim is an investigation of the influence of one variable on another, an experiment is the only possible method that can capture this cause-effect relationship. For this reason it would be reasonable to suggest an **additional** research method, not an **alternative** one.

From the point of view of testing the effects of compassion training on prosocial behaviour in real-life settings, the main drawback of the experiment is that the way the dependent variable was measured was still quite far removed from real-life settings. Although participants were not expected to realize that helping or not helping the co-player was part of the study, they still realized that they were participating in an experiment when they were playing the prosocial game. Therefore an additional research method could seek to corroborate the conclusions in a wider context of real-life situations. As such, correlational research could serve this function. One of the correlated variables could be the duration of participation in compassion training in a group of participants. Another characteristic (measured through a questionnaire) could be a wide range of self-reported prosocial

behaviours towards strangers in various real-life situations. If the effects of compassion training do endure outside of the research context, we must see a positive correlation between the two measures. Cause-effect inferences on the basis of correlational research will be impossible, but insight into real-life behaviours will be deeper.

Other suggestions of additional methods are also acceptable provided that they are justified with reference to the original aim of the study. For example, students may justify an observational study, arguing that it would provide an additional insight into how exactly the behaviour of participants towards strangers changes after compassion training. Or they could justify undertaking interviews, saying that this would provide an insight into the subjective experiences and interpretations of participants going through training – something that a quantitative study cannot capture.

If an appropriate method is suggested but no justification is provided, a maximum of one mark should be awarded for the answer. If the alternative or additional method is justified but not linked to the aim of the study, a maximum of 2 marks should be awarded. If an inappropriate method is suggested, no marks should be awarded. If more than one reason for the choice of an additional or alternative method has been suggested, no extra marks should be awarded for the extra reasons.

2. Describe the ethical considerations that were applied in the study and explain if further ethical considerations could be applied. [6]

Ethical considerations that are important in the context of the study include the following.

Protection from harm. Participants in this study were required to take part in a relatively lengthy procedure, which could be somewhat sensitive in terms of protecting participants from mental harm. Participants were required to undergo a one-day training session based on meditation techniques. They visualized various people and sent them positive thoughts, under the guidance of a meditation instructor. It is possible that some participants could have felt uncomfortable with the idea of sending positive thoughts to strangers, or even with being forced to do things they did not want to do. This might have increased their anxiety or other mental health issues. To prevent this from happening, researchers must ensure that: (a) the informed consent form clearly explains the nature of activities that participants will need to perform during the experiment, (b) it is made explicit to the participants that they may leave the study any time they want to, without giving an explanation, and (c) counselling is offered during debriefing to address any potential psychological problems or re-activated traumas that could have been a result of the study.

Consent form. It is not mentioned in the stimulus material whether or not participants were given a consent form, but evidently they were because it is common practice. It needs to be noted, however, that this study presents special requirements as to how detailed and specific the consent form must be. Since participants must undergo meditation training (which may be unusual or uncomfortable for some people) this should be explained as much as possible, while at the same time trying to prevent the participants from realizing the true aim of the study. In the ZPG game, they need to interact with what they believe is another participant in another location in Europe. In the game, they either help or do not help that participant, and this may result in some uncomfortable feelings such as remorse. To the extent possible, these effects must be outlined in the consent form.

Deception. Some major deception was involved in the study, including not mentioning the word “compassion” when recruiting participants and not telling them that their co-player is actually a computer script. Arguably, these were necessary measures to avoid bias associated with demand characteristics. However, it is especially important in this situation

to deliver a clear debriefing, allow participants to withdraw their results after they learn the true aim of the study, and offer counselling if necessary.

Confidentiality. Since the nature of the findings (as well as the very fact of participating in the study) may be sensitive to some individuals, confidentiality is especially pertinent. Participants must be guaranteed that it will not be possible to establish their identity from the results, and understand how the data will be stored and who will have access to it. Additionally, since participants see each other during the training session, they must agree not to share information with anyone outside the study, and sign this agreement on the consent form.

Debriefing. Since the study involved deception and the possibility of some participants being uncomfortable, debriefing for this experiment must be well-planned and follow a standardized procedure. The true aim of the study must be uncovered as well as the nature of deception that was used. Participants must be asked about their feelings after the participation and offered counselling if necessary. They must be given a chance to withdraw their results from further analysis. They must also have a clear idea about how their data will be stored and who will have access to it.

Withdrawal. It is important to ensure that participants can withdraw from the study at any time without explaining the reasons, and that they can withdraw their results after the debriefing session. When signing the informed consent form, participants must be clearly aware of their right to withdraw.

It is not always mentioned in the stimulus material whether an ethical consideration was applied or not, and in such cases students should not assume that it was not applied. Responses can be focused on the ethical considerations that must be applied in the context of the study described in the stimulus material (regardless of whether or not certain details are mentioned in the description).

3. Discuss how the researcher in the study could avoid bias. [9]

The study under consideration is an experiment investigating the influence of short-term compassion training on prosocial behaviour towards strangers. Accordingly, the independent variable in the experiment is compassion training (operationalized as the one-day compassion training versus memory training), and the dependent variable is prosocial behaviour towards strangers (operationalized through a specially designed computer game).

Any factor that interferes with the relationship between the independent variable and the dependent variable will be a source of bias. Such factors are also known as confounding variables, and their effect is to reduce the internal validity of the experiment. Therefore, a discussion of what could be done to overcome typical threats to internal validity would be relevant to the question.

Strong responses will start with identifying sources of bias that are especially prominent in the context of the given study and then link any suggestions made to these sources of bias. This is opposed to simply speaking about typical threats of internal validity and typical measures that researchers could take against these threats in experiments in general.

Prominent sources of bias and ways to avoid them, as applied to the study presented in the stimulus material, include (but are not limited to) the following.

Demand characteristics. Since participants go through a one-day training requiring them to rehearse positive thoughts towards others, they may realize if not the true aim of the study then at least the overall intention behind it. This may in turn influence their behaviour

on the prosocial game. It could be the case that they help the stranger more often not because they have become more prosocial, but because they want to seem this way. Demand characteristics may be avoided by using a more discrete intervention and a higher level of deception (subject to the approval of the ethics committee). If participants do not realize that the compassion training and the subsequent game are connected, demand characteristics will not be such a prominent source of bias.

Selection. Experimental methodology in independent measures designs (which is the case in this study) relies heavily on the random allocation of participants into groups. In fact, we can only strictly claim that the researcher has manipulated the independent variable if the allocation has been truly random. This consideration does not fully apply here because participants were allocated into groups pseudo-randomly – “allocation into groups depended on which slot was available at the time the participant could come”. This may create a bias if prosocial dispositions are somehow related to the time participants arrive for participation. For example, it is not unreasonable to assume that older participants work and hence can only arrive in the evenings, and if older participants happen to be more (or less) prosocial, this will create inequivalent groups. To avoid this bias, researchers should have used a random number generator to decide which participant belongs in which group, and then arrange suitable times for the training sessions.

Some other sources of bias could have been present, although it may not be directly obvious from the stimulus material. For example, if experimenters conducted the study themselves, this might have resulted in experimenter bias, and to overcome this problem the double-blind method could have been used. Such arguments are also acceptable, although they are less preferable than the ones that can be supported by evidence from the stimulus.

Marks are awarded for the relevance of the discussed methods of avoiding bias to the stimulus material, correct use of terminology in appropriate contexts, and a sustained focus on the requirements of the question.

If the response is not focused on the particular research study in question, but rather a discussion of typical sources of bias in experimental research in general, up to 5 marks may be awarded.