Introduction to Psychology: The Book "Psychology"

Focus Question and Answers (8th edition)

Chapter 1

FQ.2: What was Descartes' version of dualism? How did it help pave the way for a science of psychology?

According to Descartes, common behaviour aimed towards survival, reproduction, communication, sustenance etc. and all reflexes were the acts of the body, and the soul could only be responsible for the only uncommon act between humans and animals: thinking. He argued that the soul was located in the pineal gland of the brain and somehow triggered physical movements and reactions through the immaterial concept of pure thought. This point of view attributed many of the actions and processes to the material human body that were previously attributed to the immaterial soul; bringing human behaviour and reflexes somewhat closer to the scientific realm.

FQ.3: What reasons can you think of for why Descartes' theory, despite its intuitive appeal, was unsuitable for a complete psychology?

According to Descartes' theory, the soul thought of a proper response to a sensory input and made the body respond accordingly by pulling threads, releasing liquids etc. The actions of the body were enabled for scientific study by having been attributed a scientific and physical explanation. However the prospect of a completely immaterial concept that is the soul, not bound to the laws of nature, having physical effects on our body solely by thought did not bring the mind and mental processes into the scientific realm where it could be studied in greater detail.

FQ.4: How did Hobbes' materialism help lay the groundwork for a science of psychology?

Thomas Hobbes' theory has completely disregarded the concept of an immaterial soul and attributed every thought process and their physical reflections to the body. This way, every human action, along with the motives and mental processes, would be bound to the laws of nature and could be studied in a scientific manner.

FQ.5: How did the nineteenth-century understanding of the nervous system inspire a theory of behaviour called reflexology?

The prospect of bodily movement being completely independent of a soul brought the question of if the consciousness was also bound to the human body as well. If so, every single human action would simply be a nervous reaction to environmental stimuli – a reflex. By this definition, from the smallest to the most complex human behaviour would be the doing of our bodies, independent from a soul, as a response to whatever it comes across.

FQ.6: How did the discoveries of localization of function in the brain help establish the idea that the mind can be studies scientifically?

It was now known all human behaviour and thought that had been attributed to the soul in the past was now considered the doing of our body. The brain was the centre of this chain of command, and it utilised different portions of itself to complete various tasks. So it was concluded that the brain –which was
completely within the realm of science – basically "contained" the attributions of the old concept of soul now, and it could be studied to understand in greater detail the human behaviour. It was basically a conversion of the soul to our plane in a material vessel that it could be studied within.

FQ.7: How would you explain the origin of complex ideas and thoughts according to British Empiricism? What role did the law of association by contiguity play in this philosophy?

As for British empiricists, a child was born with their mind like a blank slate *(tabula rasa)* and all the ideas and thoughts they obtain were merely reflections of sensory experience within our minds. The small elemental ideas created and left there by these experiences came together to form greater and much more complex thoughts. When the mind encountered two ideas that occurred at the same time (simultaneously) or right after one another (contiguously) it had associated them. This connection ensured that when one of the ideas resurfaced, the other one was triggered too. This was called association by contiguity and was considered a fundamental machinery of the human mind. Association by contiguity helped explain how fragments of ideas created by sensory input could build up to complex ideas and thoughts.

FQ.8: How would you describe the influence that empiricist philosophy has had on psychology?

It has certainly laid foundations of a much better understanding of the learning and memory functions of the brain. It has made a solid proposal on how sensory feedback and its images in our brain could add up to a complete and complex concept – how we "learn" something; and how triggering one of these elements could resurface others – how we "remember" something.

FQ.9: Why is the ability to learn dependent on inborn knowledge? In Kant's nativist philosophy, what is the distinction between *a priori* and *a posteriori* knowledge?

Kant and his nativist philosophy argued that for a child to be able to obtain, memorize, combine and utilize any idea or thought that occurs, the brain needs the prior furnishing of these abilities. The basic mechanisms of learning, storage and construction of new information was considered to have been acquired at birth, namely *a priori* knowledge. Every single piece of information that has been obtained after birth via sensory experience was considered *a posteriori* knowledge and was in need of *a priori* knowledge to "be known".

FQ.10: How did Darwin's theory of natural selection offer a scientific foundation for explaining behaviour by describing its functions? How did it provide a basis for understanding the origin of *a priori* knowledge?

Darwin and his theory of natural selection argued that just as physical aspects that promote survival and reproduction are prone to being passed on rather than being eradicated; mental mechanisms and behaviour that help us survive and reproduce could also be passed on by natural selection, rendering certain behavioural tendencies *a priori* knowledge. This application of the theory to *a priori* knowledge has provided it with a solid foundation as to what the evolutionary reasons of the development of this type of knowledge could be.

FQ.12: How do neural, physiological, genetic, and evolutionary explanations differ from one another? How would you apply these explanations toward an understanding of jealousy?

Neural explanation focuses on explaining the effects of the processes and structures of the neural system on human behaviour. Physiological explanation takes on a wider perspective and involves chemical and biological material as well, such as hormones and medicine while explaining behaviour. Genetic explanation works with different genes individuals inherit, and the causality between the differences between these genes and human behaviour; basically how which genes affect which behaviours. Evolutionary explanation could be considered to be relatively broader; working with humane functions and natural mechanics brought by evolution in not only an individual, but the species as a whole.

The neural connections of the brain and complex associations with it makes regarding past experience with others concerns a neural explanation of jealousy. The role hormones and various chemicals play in the process of thought and response to situations that trigger jealousy would be the case for physiological explanation. The role of inherited genes and their role in defining characteristics of thought processes and reactions to a possible threat to the relationship with a significant someone would be the concern of genetic explanation. The role of various biological and social mechanisms in the human brain, developed through natural selection, in defining the characteristics of jealousy-inflicted conflict and methods of coping with it would be the subject of evolutionary explanations.

FQ.13: How do learning and cognitive explanations differ? How would you apply each of them toward an understanding of jealousy?

Learning explanation is rather concerned with what kind of changes on the human behaviour certain environmental experiences can inflict. Cognitive explanations take in consideration the effects of these environmental experiences to previous or inherent knowledge or beliefs, and uses these effects on cognitive abilities as a step towards understanding how behaviour changes through experience. Learning explanations, in the context of understanding jealousy, could be used to analyse the jealous experiences of a person with past significant others. This would help understand the thought patterns that led to a certain idea of jealousy, and how this

inflicts a certain reaction towards the potential threat or the significant other. Cognitive explanations take in account the unconscious memory and in-built mechanisms of the mind as well. This could help understand what processes of the mind while thinking about a threatening relationship were involved in the thought process – as well as what environmental and social stimuli was received and how it was processed to come up with an idea and a response to perceived jealousy.

FQ.14: How do social and cultural explanations differ? How would you apply each of them toward an understanding of jealousy?

Social psychology is concerned with immediate results of social and environmental input on individuals and groups; whereas cultural explanations observe a deal of settled social traditions as well, to draw a conclusion about their effects on people's behaviour and thoughts. An application of social psychology
towards jealousy would be analysing a person's idea about a relationship, what is perceived as a possible threat to a social relationship. A cultural approach would involve the understanding of an agreed upon definition of social or romantic infidelity, what pattern of thoughts and reactions and generally accepted for such situation and generally how it is seen convenient to deal with them.

FQ.15: What constitutes a developmental explanation? How would you apply a developmental explanation toward an understanding of jealousy?

A developmental explanation would regard the changes in behaviour, emotions and thoughts in different ages. People would likely be prone to value nurture as a child and begin to seek a relationship built on mutual interests as they grow; these priorities can be changed to sexuality, romanticism, trust or cooperation depending on the age and experiences. Different interpretations of what a relationship comes across, and what does the new conditions mean for both parties from the perspective of what the relationship relies on, could be applied to an understanding of jealousy.

FQ.16: What are some research specialties in psychology that are not defined primarily by the level of analysis employed?

Some of these research specialties include sensory psychology and perceptual psychology, as well as some other custom types defined as psychology of emotion or psychology of motivation.

FQ.17: What are the main divisions of academic studies? How does psychology link them together?

Main three divisions of academic studies are natural sciences, humanities and social sciences; psychology is considered a hub science, in the middle of these three disciplines. On the natural sciences end it has certainly strong connections to biology and chemistry (behavioural

neuroscience, behavioural genetics and evolutionary psychology) as well as with sociology and anthropology on the social sciences front (social psychology, cultural psychology). It is also tied with humanities as psychology is basically a study of what people do. Everything they create, the processes and the influences would be within the scope of psychology.

Chapter 2

FQ.1: How did Clever Hans give the appearance of answering questions, and how did Oskar Pfungst unveil Hans's methods?

Clever Hans has learned to distinguish and interpret subtle bodily movements of observers and used them to comprehend expected (and often correct) answers and give those answers to fulfil the duty. Pfungst has revealed Hans's methods by conducting an experiment that involved manipulating Hans's ability to observe the people around him. By restricting Hans's vision, having the person asking not know the answer or removing the observers or the person asking from his sight, he found out that Hans couldn't interpret the answers when he didn't have any subtle movements to use as a reference.

FQ.2: How are observations, theories, and hypotheses related to one another in scientific research?

The data provided by observations are interpreted by theories as theories use this data as a primary basis. Hypotheses are specific, concrete predictions deducted from a vast and vague theory.

FQ.3: How does The Clever Hans story illustrate (1) the value of scepticism, (2) the value of controlled experimentation, and (3) the need for researchers to avoid communicating their expectations to subjects?

This story shows us, firstly, how valuable it is to not give in to the fascination of a strange claim and to follow an objective path in questioning such claims. This way, the inquirer will lead a study to actually investigate – and to disprove – these rather unbelievable claims, not just try to prove. Critical thinking also plays a role in this situation, as Pfungst, according to his previous experience and knowledge about the world, had to embrace a new point of view upon every failure to prove his claim. After formulating a theory and hypothesizing, Pfungst also had to change his pattern of thought multiple times upon changing variables in his experiment and gaining more results. He changed the ability of Hans to observe his environment, the ability of inquirers to subtly move by seizing them the answers or moving them out of Hans's vision. He had recorded and interpreted these results, and sometimes advanced through his claims as new information was obtained. He has changed the conditions in which Hans answered the questions to gather new information – as well as to eliminate incorrect approaches. Also he had not let Hans interpret his expectations as well by consciously ceasing his subtle movements. He has hid his expectations while inquiring Hans's abilities, and this has helped gain a clearer and more objective perspective on what they depend on.

FQ.4: How can an experiment demonstrate the existence of a cause-effect relation between two variables?

An experiment consists of different types of variables; namely the independent variable which is hypothesized to affect the other variable when changed, and the dependent variable which is hypothesized to be affected by the changes in the other variable. An experiment seeks to describe a causal relation between these two by changing the independent variable and observing its effects on the dependent variable. It is important to keep any other variable constant while conducting this study.

FQ.5: What were the independent and dependent variables in Pfungst's experiment with Clever Hans?

The independent variable was Hans's ability to see, to determine if he would or would not be able to obtain visual cues at a certain moment. The dependent variable was the percentage of questions Hans responded correctly, defined by the state of the independent variable during each response.

FQ.6: What were the independent and dependent variables in DiMascio's experiment on treatments for depression? Why were the subjects randomly assigned to the different treatments rather than allowed to choose their own treatment?

The independent variable was the type of treatment the subjects received – or hadn't; the dependent variable was their degree of depression after 16 weeks. The subjects were randomly assigned types of treatment to eliminate any bias towards the results, as well as to balance the distribution of the treatments fairly and equally.

FQ.7: What are the differences in procedure between a correlational study and an experiment? How do the types of conclusions that can be drawn differ between a correlational study and an experiment?

In experiments, the researchers have first-hand control over independent variable and can directly observe what changes in an independent variable cause what differences in the dependent variable. In a correlational study, however, for legal, practical or ethical reasons the researchers are not given direct control over the situation. They observe various pre-existing conditions to assess a relation between primal conditions and the outcomes. However, correlational studies do not define for certain a cause and effect based relation between these variables as they cannot just be altered to serve the study.

FQ.8: How does an analysis of Baumrind's classic study of parental disciplinary style illustrate the difficulty of trying to infer cause and effect from a correlation?

It seems as the study establishes a direct relation between parental disciplinary styles and child behaviour; but since the researcher did not interfere with any variable, it is highly possible – and likely – that there are other aspects contributing to these classifications and their relations that were not taken into account. Since in a correlational study it is not possible to manipulate certain conditions and observe their effects on the outcome, any link that is being tried to be established between the disciplinary style and the behaviour of children would be much weaker than it would be with an experiment.

FQ.9: How do descriptive studies differ, in method and purpose, from experiments and from correlational studies?

Experiments and correlational studies both try to assess a relationship that varies in strength, but is existent nonetheless. Descriptive studies, however, are only interested in the conditions and try to define a certain behaviour, mind-set or a mental condition; their prevalence, increase etc. without trying to assert a specific initiator or a set of conditions within a cause-effect spectrum.

FQ.10: What are the relative advantages and disadvantages of laboratory studies and field studies?

Laboratory studies offer greater control over the variables as it is a more controlled environment. Researchers are able to manipulate the variables to their desire to observe clearly how the outcome changes. However, the fact that the subject is under careful observation can sometimes alter their

behaviour and lead the researchers to record artificial, unnatural outcomes, which can then obscure the results of the study. A field study is much more convenient in this case; the subject is in an environment that is a part of its everyday life, and so their observed behaviour is more natural and would probably ensure a clearer outcome of the study. However the researchers' control over the field is much scarce, so it might not be possible to alter the variables to observe their effects clearly.

FQ.11: How do self-report methods, naturalistic observations and tests differ from one another? What are some advantages and disadvantages of each?

Self-report methods are identified by the own statements of the subject about their behaviour and mental state. Naturalistic observations, however, do not interfere with the subject or even come into contact – they are mere observations of the subject in their ordinary life. In tests, the researcher deliberately obstructs the subject's pathway by presenting a problem or a question, and the factor of interference separates this method from naturalistic observations. Self-report methods are a direct procedure to extract exact answers from the subject without having to observe them and deduct possible explanations. While being relatively fast and direct, self-report methods are often risky that the subject might –intentionally or not – manipulate their answers and distort the outcome they may lead to. Also, self-report methods depend on content that can be subjective, misinterpreted or remembered incorrectly; this fact renders self-report methods' reliability somewhat arguable. Naturalistic observations, on the other hand, present a clearer image of what might a person's everyday life, and the thoughts and emotions that they go through in the meantime. This method ensures a more naturalistic answer, but due to the fact that the subjects are aware of the researchers' presence, they can –again, intentionally or not – change the way they behave and reflect their thoughts and emotions, which can again obstruct a healthy analysis of the results. Tests are convenient to perform and can be scored easily on a basic scale, however they are, by nature, artificial and sometimes do not fully reflect how the behaviour, thoughts and emotions derived from the test results could be applied to everyday situations.

FQ.12: How do the mean, median and standard deviation help describe a set of numbers?

The mean is the sum of the data divided by the number of data, the median is the score that is in the exact middle when all the data is put in an order from the smallest to the largest, and the deviation is a measure of how much the individual scores fall apart from the mean. These information help explain the variability of a set of scores; which indicates how apart each data falls from each other and the mean.

FQ.13: How does a correlation coefficient describe the direction and strength of a correlation? How can correlations be depicted in scatter plots?

A correlation coefficient calculation produces a score ranging from -1 to +1. The absolute value of the score defines the strength of the correlation. Correlation between two variables can be placed onto this scale. Results ranging from -1 to 0 show an inverse proportion between the variables which means an increase in one of them can cause a decrease in the other. Results ranging from 0 to +1 describe a direct proportion between the variables which means an increase in one results in an increase in the other, and a decrease in one results in a decrease in the other. These correlations can be depicted on a scatter plot by designing plots that show one of the variables and the one variable that is being tried to be measured, and by pinpointing every variable within the plot to the exact point they fall on. If these points are tightly clustered to form a line, it can be concluded that they have a strong correlation. If they are scattered across the plot and do not form a visible line, the conclusion is that they have a weak correlation.

FQ.14: Why is it necessary to perform inferential statistics before drawing conclusions from the data in a research study?

Inferential statistics are a method of assessing the real effect of the variables in a research study. It helps understand how much of the results obtained were doings of "luck" – or uncontrollable facts, and how much could actually be attributed to the variables that the researchers had accounted for.

FQ.15: What does it mean to say that a result from a research study is statistically significant at the 5% level?

It means that through inferential statistics, the results obtained from a study is conclusively largely due to the variables that the researchers have accounted for; and a small part of these results – 5% or smaller – were due to chance or circumstances that were unaccounted for.

FQ.16: How is statistical significance affected by the size of the effect, the number of subjects or observations, and the variability of the scores within each group?

A large effect size is less likely to be caused by pure luck than a small effect size, therefore it is more likely that large effects sizes constitute higher statistical significance. Similarly, larger subject numbers render the chance of pure luck being the only factor significantly low. This means that the more subjects there are, the more statistical significance it is possible to attribute to the study. The variability is the spread of scores depending on variables accounted for or not, therefore less variability within subjects indicates a lower effect of luck or chance, and a higher statistical significance of the data.

FQ.17: What is the difference between random variation in behaviour and bias, and why is bias the more serious problem?

Random variance is, by definition, a set of randomly scattered scores that are not necessarily related to the study that can be calculated and, to an extent, eliminated. Bias, however, is an inherent error within the set of scores or the measurement elements that can't be detected or eliminated; and could constitute a completely wrong result of a study that would not be detectable. Therefore bias is a greater threat for a healthy result since it is not within the natural spectrum of scores and variance that scientific studies can account for.

FQ.18: How can a nonrepresentative selection of research subjects introduce bias into a) an experiment and b) a descriptive study?

A nonrepresentative selection of subjects can lead to pre-existing conditions and mentalities to obstruct a clear view of the true results in a study. These differences cannot always be detected if a nonrepresentative selection is the case; however if the pre-existing conditions of the subjects in an experiment are not taken into account during the determination of techniques, then these variances can be calculated and separated from the actual results afterwards. Likewise, a descriptive study needs to make use of subjects with equally distributed variance, which means these researchers need to avoid directing their study to a single portion of the subjects that could introduce bias into the study, because of some factors in their nature or relations with the study that cannot be taken into account.

FQ.19: What is the difference between the reliability and the validity of a measurement procedure? How can lack of validity contribute to bias?

Reliability is the extent to which a method of measurement proves accurate depending on different measurements by different observers. Validity, however, is the applicability of the data measured to the actual question of the study. A lack of validity would introduce incorrect correlations between various data, which could cause incorrect assumptions to be made about to question, using true data that introduces bias because of its unsuitableness to the question and a vagueness in describing the terms that would be used as criteria.

FQ.20: How can we assess the validity of a measurement procedure?

If a study is replicable – meaning that it yields the same or similar results when executed again, it is considered valid. Correlating the scores obtained with a different indicator – called a criterion – of the characteristics to be measured is also one effective way of assessing validity to a measurement technique.

FQ.21: How can the supposed phenomenon of facilitated communication by people with autism be explained as an observer-expectancy effect?

The so-called facilitator guided the other person's hand to help tem type the words they are intending to. However, studies have shown that these facilitators – consciously or not – led the other person's hand to the keys by subtle movements, constituting a guidance to the hand. These subtle movements were results of the facilitator's expectances of what key would be pressed next. This constitutes an example for observer-expectancy effect.

FQ.22: What are two ways by which an observer's expectations can bias results in a typical experiment? How does blind observation prevent such bias?

An observer might be prone to subconsciously demonstrate cues towards the results they expect from the subjects, leading the subjects to actually be effected by these signals and producing the expected outcome. Another way this can occur is that observers might misinterpret ambiguous or vague signals from the subjects as being closer to those that they expected from the subjects, leading to a false evaluation of the shown behaviour. Blind observation ensures that the observer lacks the information about the study procedure and content that can cause them to produce any biases.

FQ.23: How can subjects' expectancies bias the results of an experiment? How does a double-blind procedure control both subjects' and observers' expectations?

A subject can subconsciously condition themselves that a certain treatment will affect them in a certain way, and this can cause the expected effects to actually appear, not as an effect of treatment but because of the subjects' expectancies. A double-blind procedure constitutes that neither the observers nor the subjects know the nature of the treatment the subjects receive, which prevents both parties from misinterpreting certain cues as actual effects of the treatment.

FQ.24: What are ethical concerns pertaining to privacy, discomfort, and animal welfare in psychological research? How do researchers strive to minimize problems related to these concerns?

Regarding privacy, an aspect is that the subjects would have to share information only to the extent that they feel comfortable about doing so. Anonymity is a main aspect of these studies as well; the personal

data collected from the subjects by the researchers should be kept in ways that ensure anonymity. Another concern that has been raised regards possible discomfort and harm; if there is a risk of discomfort and harm to the subjects during the execution of the study, alternative ways that would prevent the discomfort and harm should be sought. If these endeavours are without result, the subjects need to be disclosed the information regarding possible discomfort and harm during these studies in a procedure called informed consent, and also be made aware that they are allowed to quit the study at any time they want. Deceiving subjects is sometimes a necessity for the sake of the study, however this has been viewed as an ethically compromised practice. To balance out the short falling of informing of the subjects, they are instead debriefed; meaning the true nature of the study has been disclosed to them after the session. Animal welfare has been a widely discussed topic throughout modern psychology; unlike past studies, aspect of animal welfare has become of great importance. The animals need to be taken care of properly, and unnecessary suffering must not be implied. This also indicates the researchers' responsibility of ensuring that the benefits of the study would outweigh or at least balance the harm or deprivation caused to the animals.

Chapter 3

FQ.1: How can genes affect behavioural traits through their role in protein synthesis?

Genes are influential in regulating the body's production of various types of proteins that regulate physical development. These physical developments, along with environmental stimuli, constitute our behaviour.

FQ.2: What does it mean to say that genes can influence behavioural traits only through interaction with the environment? How are genes involved in long-term behavioural changes derived from experience?

The genes would not influence behavioural traits only by themselves; they require environmental stimuli to be activated and to produce a proper response in the form of changes in physical traits. The further interaction is made with a certain aspect of environment, the more and greater variety of proteins are produced, the more bodily and nervous changes are induced; therefore the behaviour changes. Therefore we can conclude that changes in behaviour are a result of a constant interaction between the environment and genes.

FQ.3: How can the same genotype produce various phenotycopes?

For identical twins who share the same genotype, even the smallest of differences in environmental stimuli can add up to different inductions of genes that trigger different proteins to be produced; therefore internal and external bodily traits to develop in different ways.

FQ.4: How does meiosis produce egg or sperm cells that are all genetically different from one another?

During meiosis, instead of directly splitting in two after the chromosomes have been copied, the cell instead splits in four and before this, the copied chromosomes line up with each other and randomly exchange parts to randomise the gene variations of each cell. When the cell splits, four cells with randomly distributed genetic content is produced from a single cell with identically ordered genetic content to other body cells.

FQ.5: What is the advantage of producing genetically diverse offspring?

Rather than producing an individual with the exact same genetic properties, adding variation to genetic arrangement ensures a higher chance of adaptation to environmental conditions. By having a completely unique set of genetic information than that of anyone else, every individual has an increased chance of adapting better to their environment and stand a higher chance of surviving any unforeseen condition. This also ensures that their offspring will have a completely unique set of genetic composition as well.

FQ.6: What is the difference between a dominant and a recessive gene (or allele)?

A dominant gene (or allele) is one that is more prone to produce effects in both homozygote and heterozygote conditions. Recessive genes, however, can only produce their effects in homozygote conditions. For a recessive gene (or allele) being heterozygote means that there is a dominant one at the other end of the pair which will deactivate the effects of the recessive gene (or allele).

FQ.7: Why do three-fourths of the offspring with two heterozygous parents show the dominant trait and one-fourth show the recessive trait?

When the genes of the parents are crossed, it is shown that one-fourths of the offspring is homozygous for a dominant gene, two-fourths is heterozygous, and one-fourths is homozygous for a recessive gene. Since dominant genes will produce their effects regardless of homozygous or heterozygous conditions, three-fourths of the offspring show the dominant trait with only on being homozygous for it. The remaining one-fourths of the offspring is homozygous for the recessive gene which would show its effects, for the lack of a more dominant gene.

FQ.8: Why might a disease caused by two recessive genes persist in the gene pool?

A disease that requires two recessive genes at the same locus could still, despite being potentially fatal even, could persist not because of the disease itself but because of some bodily conditions it brings. Sometimes the effects of the genes that carry a disease can be surprisingly beneficent in coping with a different environmental challenge, maybe even another disease. The real benefit of these conditions would be for the carriers – those with heterozygous alleles in a locus. They could both benefit from the single gene that produces the effects that would be beneficial for them in a specific setting; and also not be effected by the disease itself. If the potential of passing on or being threatened by the disease is outweighed by the potential benefits of having those specific genes, the disease might still be able to stay in the gene pool.

FQ.9: How did Scott and Fuller show that the difference in fearfulness between cocker spaniels and basenji hounds is controlled by a single gene locus, with the "fear" allele dominant over the "non-fear" allele?

Scott and Fuller had conducted an experiment involving breeding these dogs and observing their behaviour towards the presence of a human. Where basenjis were afraid of human presence, cocker spaniels did not show any signs of intimidation. When the researchers have bred these specimens, they have observed that all the cocker spaniel – basenji hybrids (F1) have shown fear towards humans and therefore concluded that fear in these species was determined by a single dominant gene locus. They have decided to take the experiment one step further and cross-breed the F1 hybrids with the expectation that three quarters would show fear and one quarter wouldn't (F2). Their predictions were confirmed by the test results. They have also mated F1 hybrids with purebred cockers with the expectations that half of them would show fear and half of them wouldn't, which was also confirmed by the results.

FQ.10: Why would it be a mistake to conclude, from Scott and Fuller's work that fear in dogs is caused just by one gene or that it is caused just by genes and not by the environment?

Scott and Fuller's experiment did not utilise every possible variable. They have only determined that fear was caused by one gene in these specific breeds of dogs. They have neither conducted any studies nor

had any conclusive result about whether fear in any other dog breed was controlled by a single gene as well. A later study of Scott (1963) has found out that deprivation of human presence to cocker spaniel puppies for the first 4 months of their lives caused them to be afraid of humans. Scott has succeeded in changing environmental conditions to render genetic effects inactive. The conditions that the puppies in the previous experiment was also a deterrent; showing basenji puppies constant affection and isolating cocker spaniel puppies from human contact could have changed the results on the contrary as well.

FQ.11: How do genes and the environment interact to affect individuals with PKU?

Individuals with PKU are not inherently "sick" – their regular diet is a crucial deterrent of the disease. Babies with the PKU genes that have been placed in a phenylalanine-free diet have showed no signs of intellectual disorders. These babies have grown to be adults that are able to eat phenylalanine without any negative consequences that the PKU genes would cause. Therefore it is possible to conclude that the PKU gene and a diet containing phenylalanine could interact to show the genes' negative consequences on individuals with the genes.

FQ.12: How does the distribution of scores for a polygenic trait differ from that usually obtained for a single-gene trait?

A trait obtained from a single-gene trait can be placed into one of two groups – there is either the genes' possible effects, or not. In the case of polygenic traits, however, many more than one gene is responsible for a trait so the severity of the trait can be placed on a spectrum. For single-gene traits it is easy to detect the frequency; it depends on the genetic structure of the parents, the individual and the chances of these single genes being passed on to the offspring is easy to calculate. However in the case of polygenic traits, the possible scores obtained is placed on a scale. A normal distribution of this trait would form a scale with the most scores in the middle with the prevalence decreasing towards the two extremes. In conclusion it is not possible to simply categorise polygenic traits as it is for single-gene traits; they have to be placed on a spectrum to analyse the prevalence and tendency towards the extremes.

FQ.13: How are the characteristics of animals shaped through selective breeding?

After various polygenic characteristics of animals have been detected, located on the spectrum and decided to be promoted; the process followed with basically evaluating every animal for their designated trait and breeding those who best fulfilled the trait that was being searched for. For single-gene traits the process was quick and easy to determine; for polygenic traits it was a lot slower and more gradual.

FQ.14: How did Tryon produce "maze bright" and "maze dull" strains of rats? How did he show that the difference was the result of genes, not rearing?

He has bred the rats that had the most errors while in a maze within themselves and that had the least errors within themselves, and kept the two strains apart from each other and bred these strains within themselves. After 7 generations the result was that the strain of "maze bright" rats and "maze dull" rats have almost completely strained from each other with almost no overlap within the scores, meaning even the worst of the "maze bright" rats was better than the best of "maze dull" rats. To prevent the influence of fostering on their abilities of learning mazes, Tryon has cross-fostered the strains, meaning a strain's offspring was raised by the adults of the other; this has not changed the perceived influence of

genes over the strains' abilities, therefore Tyron has concluded that this ability depended on genes and not rearing.

FQ.15: Why is the strain difference produced by Tyron not properly characterized in terms of "brightness" or "dullness"?

Being dull or bright at learning a particular maze does not depend on a single trait of the rats; these traits involve a deeper influence of the learning, memory, sensory, motivational and motor processes that could, with specific changes, considerably effect the results that were obtained from the study. The level of interest that the rats show for different aspects of the maze problem could be an influence over their success as well. Being "maze bright" and "maze dull" are complex traits that comprise of many other processes and they cannot be defined by such basic terms.

FQ.16: How might a better understanding of epigenetics change the way we view genetic inheritance?

Epigenetics are not responsible for changing fundamentally our genetic information, but rather operating as a switch for certain genes – lifetime experience with social environment, eating habits or nurture routines are shown to effect the offspring in ways that cannot be directly attributed to the genes – because the possible gene pool is simply that of their parents – but epigenetics. A better understanding of epigenetics could enable us to view genetic inheritance of traits from some other point of view than directly through DNA, and with more regards to personal experience of life and various environmental stimuli.

FQ.17: What insight led Darwin to his theory of evolution? How is natural selection similar to and different from artificial selection?

He has been influenced by artificial selection – the process of breeding an animal or a plant with those who share the desired trait to promote the observable effects of this trait. This has been the foundation for Darwin's idea of natural selection on the basis that it promotes the reproduction of animals and plants that inherit demanded or necessary traits, and that those who don't, die off without passing their genes on. However, the difference lies in the principles that artificial selection and natural selection rely on; natural selection does not depend on the needs and desires of humans but rather the obstacles and conditions of nature that the species have to overcome through developing various traits.

FQ.18: How are genes involved in evolution? What are the sources of genetic diversity on which natural selection acts?

Genes are involved in transferring genetic information through generations, and two main mechanics that genes use to change the genetic information in every step are the crossing over of various strand parts and mutation. Mutations are often harmful and therefore wiped out by environmental conditions, but they can occasionally be beneficent as well. Many mutations that contribute to the survival and reproduction of a species add up in time to constitute greater and much more complex evolution. Although immediate conditions of an environment and its effects on a living being does not directly pass on to its offspring; evolution, in the case of extremely severe conditions, can occur rather rapidly and observably.

FQ.19: How does change in the environment affect the direction and speed of evolution? How did a study of finches illustrate the role of environmental change in evolution?

If the change in environmental conditions is fast and severe enough, pretty rapid changes can be observed, and be passed on to the offspring. The study on finches have shown that starving finches have quickly adapted to the new environmental conditions by strengthening their beaks to be able to break the closed seeds. These changes and its variations can have direct influence over evolution.

FQ.20: What are three mistaken beliefs about evolution, all related to the misconception that foresight is involved?

Firstly, it has been believed that evolution served a specific purpose, precisely in anticipation of changes in environmental conditions, even though it is impossible for animals to anticipate specific changes in conditions and competitors; also many of these changes that turned out to be beneficial were neutral or harmful at the time they have appeared. Secondly, evolution was believed to have a destination and a level of progress relative to other living beings. This perception is still relevant; humans are believed to be the "most evolved" of animals, even though the level of evolution is impossible to measure simply by subjecting every living being to the adaptable conditions of a single one of them. Lastly, evolution was believed to eliminate evil and promote good in the environment, even though the nature does not inherit any innate moral compass, therefore does not strive to serve a perception that has only been embraced by us humans.

FQ.21: How does an understanding of evolution provide a basis for functionalism in psychology?

Evolution argues that the physical and mental traits that promote survival and reproduction the most are developed more and passed on through generations. Functionalism, stemming from this mechanic, argues that the same rule applies to behavioural traits as well; those which promote our survival and reproduction also get developed and passed on through generations.

FQ.22: How are distal explanations of behaviour different from, but complementary to, proximate explanations?

Distal explanations are aimed to explain the evolutionary mechanics and reasons behind certain behaviour, whereas proximate explanations strive to explain immediate environmental stimuli that triggers such behaviour. These explanations complete each other from the perspective of long-term evolutionary mechanics, how they promote survival and reproduction and the immediate execution, short-term demonstration of the functions of these traits as well as the stimuli that triggers them, therefore are complementary to each other.

FQ.23: What are four reasons for the existence of traits or behaviours that do not serve survival and reproductive functions?

First of them is that some traits that do not serve survival and reproductive functions used to serve these purposes. Some of these traits were fundamental to our ancestors' survival, however they have been rendered useless by our evolutionary pathway and various changes in our environmental settings. Secondly, these neutral traits may have been produced as by-products or side effects of other evolutionary traits. Thirdly, some traits may have been results of pure chance. Inconsequential traits are not eliminated or promoted by natural selection and therefore have been prospering around the world, seemingly without any reason. A final reason could be that evolution could only furnish us with such capabilities that we would possess certain drives for certain purposes, with no guarantee of coming across them – or being able to distinguish every single scenario from one another with regard to whether

these drives would come in handy; in another words, these evolutionary functions can sometimes not serve a purpose for the exact situation, but the primal drive that is perceived to lie beneath.

FQ.24: What evidence supports the idea that many human emotional expressions are examples of species-typical behaviours?

The fact that these behaviours are universal – meaning they can be observed almost equally in every part of the world including those societies that have had almost no other human contact – is an important indicator of these expressions are species-typical behaviour. Also some children that have had no chance of learning and imitating these behaviours because they were either blind or blind and deaf from birth are also demonstrating the same behaviour, which goes to support the idea.

FQ.25: How do human emotional expressions illustrate the point that species-typical behaviours can be modified by learning?

Some of these universal expressions differ in characteristics as in the prevalence and the aim they are being used for. This indicates that these species-typical behaviours can be altered by cultural accumulation throughout various parts of the world.

FQ.26: How do the examples of two-legged walking and language in humans, and singing in white crowned sparrows, illustrate the point that species-typical behaviours may depend on learning?

Two-legged walking and usage of language is practiced constantly by human infants on their own initiative, however during this species-typical practice sessions they don't only learn how to speak and walk in terms of physiology; they also learn how and why they do that. If they were to be deprived of any human contact for the first years of their lives, they wouldn't show any struggle to acquire these skills. White-crowned sparrows need to hear the singing as they are chicks so they can learn and imitate in during the mating season. If they are deprived of the songs as chicks, they won't sing themselves even though these actions are supposed to be species-typical and innate.

FQ.27: How is the concept of biological preparedness related to that of species-typical behaviour? How do the examples of human walking and talking illustrate biological preparedness?

Biological preparedness is the nervous, physical and mental predisposition of a living being to acquire certain skills and complete certain tasks. This biological preparedness constitutes the base upon which an individual builds their species-typical behaviour. In the examples of two-legged walking and talking, human infants are born with adequate proper muscular and nervous structures within their faces and limbs – as well as proper development of the parts of brain that manage these actions – that allow them to walk on two legs or speak.

FQ.28: Why is the concept of species-typical behaviour relative rather than absolute?

Species-typical behaviour, although stemming from genetic disposition, is considerably influenced by experience and environmental conditions and therefore its absoluteness should be regarded with a healthy scepticism in order to better evaluate the environment's role in these behaviours before we regard them as species-typical or not.

FQ.29: What is the difference between a homology and an analogy, and how can researchers tell

whether a similarity between two species in some traits is one or the other?

A homology is any functional similarity that is inherited from a shared ancestor and has been mostly preserved regardless of all other evolutionary differences. Analogies, however, do not stem from common ancestry but rather convergent evolution – that is, two species that do not share a common ancestry developing same or similar characteristics in accordance with their environmental conditions. Scientists can determine which category a similarity falls under by looking at the last common ancestor of the two species in question; if this ancestor has the same characteristic that is being investigated, then it can be concluded that this characteristic is a homology. If not, the contrary conclusion can be made.

FQ.30: How are homologies used for learning about (a) the physiological mechanisms and (b) the evolutionary pathways of species-typical traits?

Homologies can help identify the purpose and physiological mechanics of a certain behaviour and its role in serving a desired purpose. A certain trait can be analysed by comparing it to the similar traits of other creatures who have shared a common ancestor with the living being in question. This comparison can help assess the aforementioned values to these species-typical traits.

FQ.31: How do studies of homologies between humans and other primates support the view that the human greeting smile and the human happy smile have separate evolutionary origin?

These studies have shown that the greeting smile that didn't require a happy mood was generally used to indicate submission, non-aggression and friendliness; and the genuine smile has been found out to have different physical properties than a greeting smile that rendered it subconsciously believable ad therefore impossible to fully replicate.

FQ.32: How can we use analogies to make inferences about the distal functions of species-typical traits?

Analysing analogies in different living beings cannot be used for detecting evolutionary origins but rather showing commonalities in the living environments and conditions of various beings. Assessment of analogies can give us clues about the living conditions, certain behaviours and species-typical traits of the two species in question.

FQ.33: What is Trivers' theory of parental investment?

The theory of parental investment argues that in a species, a sex that is more caring of a parent will be more selective in choosing a mate than the less-investing sex, and the less-investing sex will strive harder to mate with a more caring sex.

FQ.34: Based on Trivers' theory of parental investment, why does high investment by the female lead to (a) polygyny, (b) large size of males, (c) high selectivity in the female's choice?

The female has relatively much higher investment than the male, because of physiological and genetic dispositions and limitations. Since in a given time period the male has a potentially much higher mating count than the female, males can often mate with multiple females in a given time while each of these females can only support one infant, and therefore can be impregnated by only one male. Males often fight each other for mating rights over a group consisting of many females, and usually the larger, heavier, stronger and more aggressive one wins. This has enabled these physically superior males to pass

on more genes in comparison to the weaker ones. This has also led to a high selectivity in the female's choice. Since with the aforementioned biological and physiological limitations the females can produce less offspring than the males, the females ensure that their infants would be stronger and larger by mating only with the stronger males so their offspring can successfully create an offspring of their own as well.

FQ.35: What conditions promote the evolution of polyandry? How do sex differences within polyandrous species support Trivers' theory?

If a species' females are able to reproduce quickly and can produce more offspring than only she or she and her partner can care for, the best strategy of the female is to mate with as much males as she can, then leave the offspring with the male to be the main or sole carer. This is observer more in species that lay eggs, since the physical investment the female has to make is much less relative to that of mammals. Consistent with the theory, the females are observed to be stronger and larger than the males in these specific polyandrous species, in order to be able to preserve their family and territory as well as to make an appeal for the males and to intimidate the females and to eliminate any threat they might pose.

FQ.36: What conditions promote the evolution of monogamy? Why are sex differences in size and strength generally lacking in monogamous species?

Monogamy is often observed in species that require both parents for the offspring to be nurtured and raised. Often one parent cares and protects the infants while the other leaves to bring food. This mechanic promotes social monogamy between such species. Since it is favourable for both sexes that their mates stay socially tied to them, there is no need for competition in size or strength between the members of the same sex. Therefore both sexes physically develop on average the same, which identifies the lack of difference in size and strength.

FQ.37: For what evolutionary reasons might monogamously mated females and males sometimes copulate with partners other than their mates?

For an individual, mating with an opposite sex that is stronger than their socially monogamous partner is often favourable since it will produce stronger offspring as well. Since there is no detectable difference is size or strength between individuals, they increase their chances of having stronger offspring by mating with their neighbours. The females ensure that their eggs can be fertilised by a quality sperm, and males ensure that they can populate as much as possible while protecting the offspring they have from their socially monogamous mate.

FQ.38: What appear to be the evolutionary advantages of promiscuity for chimpanzees and bonobos? In what ways is promiscuity more fully developed for bonobos than for chimpanzees?

Chimpanzees and bonobos have adapted promiscuity in order to relieve the sexual stress between individuals of the same sex, specifically over that who mates with who. It also obstructs the male behaviour of killing the young that are not their own, by basically confusing everyone over who fathered which young. Both methods have enabled these species to form groups that live in relative harmony. Chimpanzees sometimes show monogamous tendencies by forcing their presence over a female, which doesn't occur in bonobo groups. For them, sexual activity of any sort is a way of reducing tension whether it is caused by reproductive behaviour or not. Therefore bonobos have adapted more to

promiscuity than chimpanzees in grounds to how fundamental of an element sex constitutes for them.

FQ.39: What evidence suggests that humans evolved as a partly polygynous species? How is this consistent with Trivers' parental investment theory?

Humans are part of a small portion of mammals that receive both direct and indirect support from their paternal figure, making monogamy consistent with our nature. However, how crucial is the support of the father is a little less than that of the mother, so this stays consistent with the polygynous nature as well, since a male can biologically father many more offspring than a female can. In some cultures polygyny is still practised, although it is not considered ethically suitable in many modern societies. The lack of a significant difference between the males and females, as well as the strengthening of the immune system and various other traits is a deterrent of our sexual behaviour in this case as well.

FQ.40: From an evolutionary perspective, what are the functions of romantic love and sexual jealousy, and how is this supported by cross-species comparisons? How is sexual unfaithfulness explained?

Romantic love and sexual jealousy stems from our general need of composing a family with both parental figures and their offspring. While love creates bonds, jealousy often tries to preserve them by fending off possible threats. Comparison between humans and superb fairy wrens show that their monogamous behaviour has similar – but obviously analogic – motivations. These mechanics are means to create a durable family bond and preserve it so that meanwhile both parents can raise the young. Sexual unfaithfulness is sometimes a consequence of lust, which pushes humans to act outside moral boundaries and mate with multiple people to create more offspring to carry their genes. The male would be able to send more copies of his DNA through his offspring and a female would raise her chance of being impregnated by sperm that are superior to that of her husband.

FQ.41: How is male violence towards infants, towards other males, and toward females explained from an evolutionary perspective?

Male violence towards infants that some other male fathered could be motivated by the male demand to gain the attention of the female that is nursing the young; to get them to stop lactating and become suitable for copulation once again. Aggression and violence other males is motivated by either access to desires sources – usually females to mate – or to promote their social status within the troop. It could also be triggered by an act of threat towards the mate of a male, and their protective behaviour would be manifested by aggression and violence. Males also show aggressive behaviour to females to force copulation over them – or to prevent the female from mating other males.

FQ.42: How do the kin selection and reciprocity theories take the altruism out of "altruism"? What observations show that both theories apply to humans as well as other animals?

Kin selection seems like a form of altruism but actually does not preserve its essence due to the fact that in times of great threat or deprivation, the individual seeks the greater good of its genes and those that inherit similar genes. The main purpose is to actually ensure and help that the same genetic pool will prevail under any circumstance. This fact serves an evolutionary purpose to the seemingly altruistic individual which, to say, takes altruism out of altruism. Reciprocity theory is also a similar case; an individual decides to help non kin as much as – if not, more – than the kin in some circumstances, but this stems from the expectation that the favour will be returned one day, which also goes against the true nature of altruistic behaviour. The application of this theory has been shown with various studies.

Some suggest that people who are further from their kin and closer to non kin are still predisposed to favour the kin more. A deeper analysis has shown that the regard for kin and non kin depends on the qualities of the favour that has been granted to the individual. This goes to say that humans favour kin more in some certain situations, and non kin in some other. Some animals also share food or form packs with non kin animals.

Chapter 4

FQ.1: What are three types of neurons, and what is the function of each?

First type is the sensory neurons which are responsible for carrying nervous signals through the peripheral nerves they have formed and transmitting them to the central nervous system. The second type is motor neurons that carry out messages from the central nervous system through the nerves they form to move muscles and glands. The third type is the interneuron which is responsible for collecting, organising, integrating and carrying messages from different sources across the body. This last type only exist within the central nervous system and vastly outnumbers the other two.

FQ.2: What are the main parts common to all or most neurons, and what is the function of each part?

There is the cell body that is common in all the cells, which contains the cell nucleus and the basic machinery common to all bodily cells. There are also the dendrites that spread off from an extension of the cell body and are responsible of collecting sensory input. The axons are also a tube-like structure stemming from the cell body which connects to other neurons or muscle cells and is responsible for the transmission of messages to other structures that they are connected to.

FQ.3: How does the resting potential arise from the distribution of ions across the cell membrane?
The resting potential is the main source of action potential and is caused by the difference between the amount of positive and negative charged ions inside and outside of the cell membrane. Depending on the potassium or sodium channels being open, these ions enter and exit the cell to create the resting or action potentials. Potassium channels stay open so positively charged potassium ions flow out of the cell and join the mostly negative charged ions. This causes the imbalance between positive charges between the insides and outside of the cell, creating an electrical tension that we call resting potential.

FQ.4: How do the two phases of the action potential (depolarization and repolarization) result from the successive opening and closing of two kinds of channels in the cell membrane?

In the resting state, the cell contains more potassium and less sodium inside than there is outside. During the depolarization state, the sodium pores open up to let highly concentrated sodium into the cell. For a moment there is an imbalance inside the cell that renders the environment temporarily positive which pushes potassium outside, just as the potassium pores open up. This constitutes the repolarization state. These two stages together form the action potential. To rebalance internal and external contents of the cell, a structure called the sodium-potassium pump releases sodium outside while potassium is let back

inside.

FQ.5: How is an axon's conduction speed related to its diameter and to the presence or absence of a myelin sheath?

A wider axon would pose less resistance, therefore conduction speed would be higher in wider axons. Myelin sheath, besides acting as a protective layer, also increases the conduction speed of the axon.

FQ.6: How do neurotransmitters at excitatory and inhibitory synapses affect the rate at which action potentials are produced in the postsynaptic neuron?

Neurotransmitters are responsible for unlocking various channels in the membrane. If this is happening on the postsynaptic membrane of an excitatory synapse, sodium channels open and sodium flows inside the cell. This decreases the negativity of the cell's insides, causing depolarization which increases the rate of action potentials in that neuron. If it is an inhibitory synapse, potassium channels open instead. The potassium flows out which increases the negativity inside that causes the cell to hyperpolarize, causing a decrease in the rate which action potentials are triggered.

FQ.7: When are most neurons "born" and when do they begin to form synapses?

Most neurons are born during the third and fourth months of gestation with a rate of several hundred thousand new neurons each minute. This process called neurogenesis lasts until adulthood, but this is the peak of the speed in which neurogenesis occurs. Around the fifth month of conception, neurons grow in size, produce more dendrites and axons and axon terminals start connecting to neurons, forming synapses.

FQ.8: How does the metaphor of sculpting apply to brain development?

Brain development could be considered similar to a sculptor having a block of marble that he chiselled down to an artistic creation that is less in amount of material but superior in aesthetic and function. During the sculpting process, the artwork goes through a rough shaping process that involves shaping the whole content by chiselling some away. Our brains go through a similar process, in which through the creation and connection of new neurons and their connections, as well as some neurons and connections dying off, it reaches its optimal state.

FQ.9: What role might mirror neurons play in social learning?

Mirror neurons are found out to enable us to follow, memorize, learn and imitate another one's actions as well as recognize our own behaviour in others. This could be applied to social situations as well; our perceptions through mirror neurons contribute to our emotional expressions, as well as constitute an identification with others through language, expressions etc.

FQ.10: How do researchers identify functions of areas of the human brain through (a) studying the effects of brain damage, (b) using a magnetic field to interrupt normal brain activity, (c) recording electrical activity that passes through the skull and scalp, and (d) creating images that depict patterns of blood flow?

Different areas of the brain are responsible for different actions or capabilities, and researchers, by comparing the areas of the brain that have been damaged in different patients and assessing the deficits

that have occurred, can estimate the function of a brain area. Researchers can also use magnetic field to inactivate or activate parts of the cerebral cortex, and observe the bodily or cognitive effects of the magnetic field on a specific portion of the cerebral cortex. Also, it is possible to use EEG to record the electrical activity throughout the brain which is reflected onto the skull and scalp. The electrodes placed enable the researchers to observe the activities of the brain – at least the surface – in different moments or during the completion of different tasks. Lastly, since more brain activity means more blood flow to that area, scientists are able to use different substances and techniques to determine the flow and accumulation of blood throughout the brain – unlike other techniques, the whole brain – and assess the amount of work that has been put to a specific area of the brain in any given moment.

FQ.11: How do researchers damage, stimulate, and record from neurons in specific areas of nonhuman animal brains to learn about the functions of those brain areas?

Researchers can determine the functions of different parts of the brain by deliberately damaging or destroying some nerve bundles in the brain using very precise electrical and chemical instruments. They can vary the exact location of the destruction of nerves and then compare the behavioural changes of subjects to correlate the location of the brain with the function they seem to serve. The contrary can be done too; different parts of the animals' brain can be stimulated by electrical or chemicals means to determine the effects of activation of different parts of the brain on the animal's behaviour and drives. A third option is not to interfere with the functions of nerves but to observe them. By placing very precise tools inside a rat's brain, it is possible to determine the actions of the neurons in different conditions.

FQ.12: How do the autonomic and somatic motor systems differ from one another in function? How do the sympathetic and parasympathetic divisions of the autonomic system differ from one another in function?

The somatic division acts on skeletal muscles that are connected to bones and can move the skeleton while contracting. The autonomic division, however, controls the visceral muscles and glands that are on the insides of our body and do not move the skeleton while contracting. These visceral muscles and glands receive two sets of neurons; the sympathetic division is responsible for managing stressful events and increasing visceral muscle activity as well as prepare the rest of the body, including skeletal muscles, for an upcoming event that requires action. The parasympathetic division does the opposite; it is responsible for energy conserving and healing activities as well as the opposites of those that have been listed for the sympathetic division.

FQ.13: What are three categories of functions of the spinal cord?

Firstly, the spinal cord carries the somatosensory information and motor control commands through ascending and descending tracts between the body and the brain. Secondly, it arranges and controls simple reflexes that are not bound to the commands of the brain. Thirdly, it generates organized rhythmic movements without the involvement of the brain.

FQ.14: How is the brainstem similar to and different from the spinal cord? What role does the brainstem play in the control of behaviour?

Both the brainstem and the spinal cord contain motor and sensory tracts, and they both manage some reflexes and some species-typical behaviour patterns. However, the reflexes controlled by the brainstem

is much more complex; it manages postural reflexes such as balance and vital reflexes such as breathing. It also manages species-typical behaviour regarding sustenance, copulation and attacking. It also manages the speed of locomotion in the spinal cord.

FQ.15: What are the functional similarities and differences between the cerebellum and the basal ganglia?

Both the basal ganglia and the cerebellum act on the management of movement, however the cerebellum acts on rapid, precise and sequential actions whereas the basal ganglia manages slow, deliberate movements. Also, the basal ganglia manages the movements and acts accordingly as they are happening, but the cerebellum plans ahead before the action has begun and initiates it as a completely programmed action.

FQ.16: What are the main functions of the thalamus?

Thalamus is generally responsible for gathering and distributing sensory and motor tracts as well as the stimulation of the brain through the distribution of the arousal pathways.

FQ.17: Why is the limbic system so named, and what function does it perform?

Its name comes from the Latin word “limbus” meaning “border”. It is considered as a border between the primal and primitive parts of the brain and the new, advanced cerebral cortex above it. Through various organs it contains, the limbic system manages emotions as well as special coordination and encoding of memories. It also has strong connections to sensory input and their interpretations as well as the conversions of emotions into actions.

FQ.18: What are three ways by which the hypothalamus controls the body’s internal environment?

It influences the activity of the autonomic nervous system, it controls the release of various hormones and it manages various drive states such as hunger and thirst.

FQ.19: What are the four lobes of the cortex, and what are three functional categories of areas within these lobes?

The four lobes are the occipital, temporal, parietal and the frontal lobes. The main functional categories are the primary sensory areas, which gather and interpret signals from sensory nerves and tracts; the primary motor area, which sends axons down the to the motor neurons; and association areas that are made up by the rest of the cerebral cortex, interpreting sensory signals and receiving input from the lower brain and managing the processes of thought, perception and decision.

FQ.20: What does it mean to say that cortical sensory and motor areas in the cortex are topographically organized?

It indicates that adjacent neurons in the brain receive sensory signals and send out motor commands from and to adjacent neurons in another part of the body as well.

FQ.21: What is the role of the prefrontal cortex in the control of behaviour?

The prefrontal cortex receives new information and/or retrieves information from long-term memory and plans a proper action in accordance with the information.

FQ.22: How are the movement-control functions of the nervous system summarized as a hierarchical, top-down flow of information? How is the hierarchy illustrated by an imaginative tour through the nervous system of a person who decides to eat some fresh cherries?

The limbic system and association cortex decide and plan the action that is going to be taken. They send these signals down to the basal ganglia and cerebellum as well as premotor areas of the cortex. These signals and the moves the command are refined in the motor nuclei of the upper brain stem and primary motor area of cortex. Then all the commands reach motor nuclei of lower brainstem and the spinal cord to be diffused to the skeletal muscles to produce movement. In the case of eating a cherry, the limbic system sends a hunger message to the cortical areas that is it connected to. These areas analyse the visual input of the cherries and conclude that they are available for consumption. The association areas also bring about other information belonging to the cherries, such as the memory of eating cherries, the smell and the taste. The prefrontal areas decide to make a move for the cherries and eat them. The prefrontal cortex and the limbic system send designated action plans to the basal ganglia, the cerebellum and the premotor cortex, as well as somatosensory information about the location of the cherries and the body parts. This information is used to refine the movements of the body. Some programs for more direct movements are processed and re-refined in the upper parts of the brain stem. The more delicate movements are processed again in the motor cortex, which in turn sends its output to the brainstem and spinal cord. Finally, somatic motor neurons receive the signal and convey it to skeletal muscles to produce movement.

FQ.23: What is the difference between knowing where a brain function occurs and knowing how it occurs?

Using different techniques to obstruct, activate or observe brain activity in different brain areas, scientists can discover where a function is served within the brain, but the information of the location does not define any internal biological or chemical reaction that would cause this particular part of the brain to be responsible from the function that it serves. Knowing physically how an action occurs is possible, but it is not dependant on the knowledge of this function's place in the brain.

FQ.24: What are some examples of long-term and short-term effects of hormones?
Some long-term effects of hormones differentiation of gender from birth and into puberty, which are irreversible. The short-term effects can range from lasting a few minutes to a few days. These hormones usually prepare the body for sudden events and encounters, such as preparing the body to either engage in violence or flee the scene by pumping sugar and fat into the blood and suppressing inflammation and pain caused by physical trauma or incisions.

FQ.25: How does the brain control the release of hormones from the two lobes of the pituitary and thereby control the release of other hormones as well?

The posterior lobe of the pituitary is directly connected to the brain via blood vessels and neurosecretory cells. When stimulated by these cells, the posterior pituitary sends the hormones into bed of capillaries. Via the bed of capillaries, the hormone diffuses into the whole bloodstream. The anterior pituitary is not directly connected to the brain, however it is closely related to it. It is activated by the hypothalamus with a substance called releasing factor, which is carried to the anterior pituitary by the bed of capillaries. The releasing factor enables the anterior pituitary to produce the designated hormones and

diffuse them into the bloodstream.

FQ.26: What is some evidence that testosterone is needed to maintain the male's sex drive?

Castrated males experience a gradual but certain loss in their sex drives. When they are infused with testosterone or their brain is chemically enabled to produce testosterone again, they are observed to gradually but completely regain their sex drive. Briefly, the lack and presence of testosterone directly and rather quickly influences a male's sex drive.

FQ.27: What kind of experiences have been shown to increase testosterone production in men? What effects might such increased testosterone have on a man's subsequent behaviour?

It is shown that the feelings of victory, social superiority and pleasure upon encountering a female can raise the testosterone levels in a male's bloodstream rather quickly, even within minutes. This increase in testosterone increases self-esteem, and subsequently aggression and competitiveness as well.

FQ.28: What evidence indicates that ovarian hormones act directly on the brain to activate the sexual drive in female rats? How do female primates differ from female rats concerning the regulation of sexual drive?

During the times of fertility, these hormones raise in level in bloodstream and many nonhuman females have been observed to seek and initiate copulation in these times especially. For most mammals, including primates, an intake of estrogen immediately shows its effects whereas some others, including rats, need to be infused with estrogen periodically and followed by progesterone is more effective as it mimics the real estrous cycle.

FQ.29: What is evidence that women's sexual drive depends more on androgens than on ovarian hormones? What evidence suggests, nevertheless, that female sexual drive does increase during the time of ovulation?

Apparently, women that have had their ovaries removed reported no decrease in their sexual drive whereas women that have had their adrenals removed do report a decrease. This suggests that sexual drive is mainly regulated by androgens. However, women have been observed to also be more sexually driven in times of high fertility in their menstrual cycle, which suggests that sexual drive increases during times of ovulation.

FQ.30: In what ways are the two hemispheres of the cerebral cortex symmetrical, and in what ways are they asymmetrical?

Both hemispheres have almost the same motor and sensory functions, but each covers a different part of the body – precisely the left hemisphere for the right, and the right hemisphere for the left. The left hemisphere is more specialised in language, and the right hemisphere deals with nonverbal visuospatial information.

FQ.31: How is it possible to test each hemisphere separately in people whose corpus callosum has been cut? How do such tests confirm that the left hemisphere controls speech and the right hemisphere has superior spatial ability?

By flashing images to one half of the visual angle and having the patient both touch the object and say

what they see, scientists were able to determine where the perceived information goes through – or doesn't – and how it is processed. The patients can usually identify the object by touching but struggle to say its name, and say the see the other object, that has been projected onto the right side of their vision. These patients were also presented various images and tasks to complete with one hand, or see with one side of their vision etc. These studies collectively conclude that verbal communication and language related matters are usually managed by the left hemisphere whereas spatial and more abstract concepts were better perceived with the right hemisphere.

FQ.32: How do studies of split-brain patients tend to confirm and extend the idea about the nature of consciousness that was developed long ago by Sigmund Freud?

These studies have shown that the left hemisphere and the right hemisphere could learn to cooperate, however since language is controlled by the left hemisphere, the patients come up with seemingly plausible but often false explanations of their seemingly contradictory actions. This has strengthened the idea of Freud that there is an unconscious decision making process and that we act according to it.

FQ.33: What are the differences between Broca's and Wernicke's aphasias in (a) language production, (b) language comprehension and (c) areas of the brain damaged?

Broca's area is anterior to the primary motor area. Studies have concluded that patients who suffered Broca's aphasia are not able to form grammatically complex sentences as well as understand them; lacking the ability to form or decipher these sentences. Wernicke's area, however, is near the primary auditory area and is rather small. Patients who suffer from this type of aphasia can maintain the grammatical integrity of the sentences but they do not convey any meaning. They also have hardship in translating heard language into meaningful transcripts.

FQ.34: How was PET used to identify brain areas involved in word perception and production?

The subjects were given different tasks that involved visual, auditory or linguistic activities and PET was used to determine brain activity during these tasks. These studies showed that during the perception and production of language, many more areas than Broca's and Wernicke's are involved.

FQ.35: What brain changes have been observed in rats and mice caged in enriched environments?
The rats that have been kept in enriched environments had thicker cerebral cortices, larger cortical neurons, more acetylcholine, more synapses per neuron, and thicker, more fully developed synapses compared to those who have been caged in deprived environments.

FQ.36: What evidence shows that practice at a skill alters neural connections so that more neurons become devoted to the skill?

Scientists, by studying animals that had a specific task to complete that concerned a specific part of their brains, or people who have been lacking in senses, discovered that often different parts of the brain developed more depending on the kind of required task or the repeated action that was done; also that some parts of the brain could restructure themselves to serve different purposes in order to compensate for the lack of some senses.

FQ.37: What evidence, with birds and with humans, indicates that spatial learning can result in growth in the hippocampus?

With birds, those species that who buried their seeds and retrieved them later had larger hippocampi and much better memories. Also, when these birds were allowed to collect and bury seeds their hippocampi grew, and when they are prohibited from doing so, their hippocampi shrink again. In humans, London taxi drivers are an example; they are able to successfully navigate themselves in that large city which causes their hippocampi to grow, which enables them to acquire spatial proficiency.

FQ.38: How has the discovery of long-term potentiation tended to confirm Hebb's theory about synaptic strengthening?

Long-term potentiation explains a neural transactions: If the connection between two neurons is weak, a third neuron can fire and trigger one of the neurons just as the other deployed neurotransmitters onto it and this strengthens the connection between the first two neurons. If this sequence repeats enough, the neurons are bound more strongly from then on. This proves Hebb's theory of synaptic strengthening.

FQ.39: What evidence shows that long-term potentiation is involved in learning?

As results of studies conducted with mice; those that have been rendered inadequate in terms of LTP have shown poor learning skills, even worse than their normal condition; those that have been enriched in terms of LTP have followed the same learning patterns however were much more efficient at remembering and repeating what they have learned.

FQ.40: What area of the brain shows the most substantial change in humans relative to other mammals?

This change is shown in the association areas of the brain. As brains of the mammals get more complex, the amount of the brain that has been dedicated to association areas rapidly increases, with human, Homo sapiens, being the pinnacle of this development. Although we share many evolutionary traits with many primates, our brain seems to be the most substantial change between us without brains being much larger than theirs – almost threefold.

Chapter 5

FQ.1: How do drives and incentives (a) complement one another and (b) influence one another in their contributions to motivation?

Incentives and objectives can reinforce each other's influences over an individual, or can compensate for the weakness of one another. If the drive is too strong, even a weak incentive can motivate a person to take an action, and vice versa. If the incentive turns out to be weak, the strong drive can render the weak incentive strong and the person can be motivated anyway.

FQ.2: How is the concept of homeostasis related to that of drive? How is this relationship demonstrated in the case of a little boy who craved salt?

Homeostasis can be described as physiologic and biologic drives that our bodies enforce on us in order to maintain its functions. D. W., the boy who craved salt, had deficient adrenal glands and his body could not absorb salt properly. Therefore his body has enforced a craving for salt on W.D. to keep it alive. The little boy, his family, or the doctors did not know about this and the behaviour of the boy was not intentional; but his body did know and it intentionally craved salt to maintain the internal balance.

FQ.3: What is the distinction between regulatory and nonregulatory drives, and how can mammalian drives be classified into five categories based on function?

Regulatory drives are those that are absolutely necessary for one's individual survival and physiological sustenance. Nonregulatory drives, on the other hand, are those that serve fundamental purposes outside of individual survival; such as reproduction, social interaction etc. The five classes of drives are regulatory drives, those that are fundamental for one's individual survival and the sustenance body's homeostasis; safety drives, those that protect us, push us to fight or flee from any potential danger or threat; reproductive drives, those that push us to reproduce, care for the young and protect our partner from any threat or danger of any kind; social drives, those that enable us to form social bonds and partnerships with others of our kind as well as gain their appreciation and a status within the social group; and educative drives, those that push us to learn about and explore our territory, ourselves and beyond as well as to gain life-sustaining skills and information through the same process.

FQ.4: What are two possible explanations of the universal human drives for art, music and literature?

One possible explanation is that the passion for art, music and literature is an extension of our educational drive – to deduct information from our environment and exercise our minds to create something out of it. Art, music and literature also serve other drives in modern society; they earn one a certain social status, and it impresses people – including the opposite sex; which are extensions of our social and reproductive drives. Another plausible explanation is that these passions are not sole drives by themselves but our pursuits of our drives by advanced means. A piece of art, through its completion or content, can satisfy many of our drives.

FQ.5: In theory, what characteristics must a set of neurons have to function as a central drive system? What characteristics of the hypothalamus seem to suit it to be a hub of such a system?

A neural set regulating these drives must be able to interpret bodily signals related to needs and drives. It also has to be able to send proper neural signals throughout the neural system and the body to carry out the proper behaviour aimed to satisfy the drive. Hypothalamus is an adequate candidate; it is located conveniently, to be able to communicate with both the body through the spinal cord and the upper brain. It has many capillaries and is very sensitive to hormones, as well as great control over the pituitary gland which is responsible for releasing many hormones. Also, harm or disruption to various areas of the hypothalamus has been observed to cause serious effects on animals' drives.

FQ.6: What are three interrelated components of the concept of reward?

Liking is the feeling of pleasure and/or satisfaction towards a certain reward. Wanting is the longing, the desire for award as it pleasures and/or satisfies the receiver. Reinforcement is the effects of award have in promoting learning; humans and animals can learn to respond in a specific manner to a stimulation after being conditioned to that the proper response to a stimuli is followed by an award.

FQ.7: How did Olds and Milner identify reward pathways in the brain?

They have discovered, by accident, that stimuli to certain parts of the brain would push the receiver subject to pursue more of this stimulation. Upon questions of whether this stimuli would affect learning, the scientists have designed a contraption that would allow the subject rats to stimulate their brains by pressing a lever. Once the rats learned that they could stimulate themselves with the lever, they have started to do it non-stop.

FQ.8: What is some evidence that the medial forebrain bundle and nucleus accumbens are essential pathways for the effects of wide variety of rewards?

The medial forebrain bundle and nucleus accumbens is stimulated by a vast variety of rewards which makes it the main source of rewards-induced motivation. Besides, damage to these areas have been shown to cause subsequent and drastic loss in rewards mechanisms which could cause the subject to die because of lack of (motivation to gain) nutrition.

FQ.9: What is some evidence that the "wanting" and "liking" components of reward involve different neurotransmitters?

The neurotransmitter dopamine is involved into the "wanting" mechanism; the "liking" mechanism is regulated by another class of neurotransmitters called endorphins. Studies have shown increase and

decrease in the release of dopamine will increase or decrease the motivation of the subject to pursue the reward; but it seems that it doesn't affect the amount of pleasure ("liking") the subject gains from it. On the other hand, changes in the amount of endorphin released seems to effect the amount of pleasure the subject gains from a certain object or activity, but it is not more or less motivated to pursue it as a cause of endorphin levels.

FQ.10: What evidence suggests that dopamine is crucial to the capacity of rewards to promote new learning – that is, to serve as reinforcers?

If a subject is presented with a cue from which it is conditioned to deduct that a reward is on its way, its attention- therefore subsequent dopamine release as a reaction – shifts from the actual reward to the cue which signals the reward. This cue can be presented repeatedly with the reward afterwards, and after a while the cue will be enough to trigger the release of dopamine without the need of the reward. After the learning process is complete, even the award itself doesn't increase the dopamine release into the nucleus accumbens. Through these findings it is possible to conclude that after a subject has learned that a cue will be followed by an award, it will shift its attention to the cue and put time and effort to predict or create the signal.

FQ.11: How does an understanding of the brain's reward system help us to understand drug addiction and compulsive gambling?

Often-abused drugs hijack brain's process of dopamine release, causing a huge release every time the drug is taken. The release of dopamine causes the subject to associate any perceived cues in the environment with the "feeling" of wanting towards the drug, which causes repeated use and an unhealthy amount of craving for it. These drugs, however, do not affect the release of endorphin which means that the longer the drug is used, the feeling of "wanting" increases and the feeling of "liking" decreases. As for gambling, the unpredictable payoff leads the brain to try to learn the pattern and earn the reward every time it is played, leading to strong associations between the unpredictable payoffs and the environmental cues by releasing a new burst of dopamine in every instance that the outcome is positive.

FQ.12: What is meant by feedback control, and how does the arcuate nucleus of the hypothalamus serve as a control center for appetite?

Feedback control is the regulation of an intake with regard to the amount and/or quality of it being fed back to the control center. The arcuate nucleus, consisting appetite-stimulating and appetite suppressing neurons, regulates the drive for food depending on the body's feedback about the amount of nutrition that is required, if there's any.

FQ.13: What is the evidence that the hormone PYY helps reduce appetite after a meal and that underproduction of PYY may contribute to obesity?

Food intake stimulates the production of PYY in the large intestine, which in return stimulates the appetite-suppressing neurons and suppresses the appetite-stimulating neurons. Elevated PYY levels can keep the appetite suppressed for as long as 6 hours. Through various studies, elevated PYY levels in blood has been observed to cause loss of appetite and a decrease in the amount of food eaten by the subjects. Therefore, it has been suggested that a deficiency of PYY production could contribute to obesity.

FQ.14: How does the hormone leptin contribute to weight regulation, and why isn't leptin a good anti obesity drug?

Leptin is produced by the body's fat tissue to regulate nutritional intake and bodily weight in long term as well. It interacts with the brain's leptin receptors to keep appetite at a relatively low level. For its properties, leptin has been seen as a hope for a weight control drug, but subsequent research has shown that the problem of obese people is not underproduction of leptin but rather their brain becoming insensitive to the hormone.

FQ.15: How do conditioned stimuli and the availability of many foods, with different flavors, contribute to appetite and obesity?

Conditioned stimuli indicating new foods and their availability, as well as a variation of foods has seen to increase hunger, mediated through the sense of taste. New foods renew subjects' appetite and those that have been presented with a greater variance of foods tend to eat more and be fatter relative to their single type food fed counterparts even though all foods they have been presented with were equal in nutritional content.

FQ.16: What is the evidence that within a culture, differences in body weight results mostly from differences in genes, but across cultures, environment plays a large role?

Within a single culture, most of the resources are equally distributed which means that environmental differences would not create a meaningful difference in the abundance of food for individuals, which leaves more space for genes to influence bodily weight through life and throughout the geography. Across cultures, the abundance of nutrition varies much more greatly than internal variance of a single culture, which renders environment a more important factor in bodily weight.

FQ.17: On the basis of the reports of successful dieters and the advice of appetite researchers, what can people do to maintain a healthy weight?

Many successful dieters as well as appetite researchers suggest that diet is an important part of the process, but the importance and influence of exercise is also often understated. Exercise not only burns fat, it also builds up muscle. These two together has proven to be highly effective relative to only diet, only exercise or neither.

FQ.18: How does a person's EEG change as the person goes from alert to relaxed to various stages of sleep?

When a person is alert, their brain sends off beta waves which are irregular impulses of neurons. When there is no focus, they change into alpha waves which are more harmonised. Through the stages of sleep alpha waves synchronise even more with beta waves disappearing, leaving harmonised delta waves behind.

FQ.19: How do REM and non-REM sleep differ, and how do they cycle through the night?

Non-REM sleep is both bodily and neurologically a rather passive one whereas during REM sleep the heart rate and breathing, along with the neural activity, greatly increase while muscle tension is decreased. Every 80-100 minutes, non-REM sleep cycle ends, followed by a session of REM sleep that lasts for around 10 minutes.

FQ.20: What are some general characteristics of dreams that people describe when aroused from REM sleep, and how do these differ from the "sleep thought" that people more often describe when aroused from non-REM sleep?

Dreams that have been seen during REM sleep are described to be very vivid, following a somewhat coherent world structure, with progressions in the story with people and happenings that are familiar to the dreamer; also many of them stem from common fears and anxieties. "Sleep thought" however is not even remotely as vivid, and there is usually no progression of the story, which is also relatively monotone to the REM dream.

FQ.21: What evidence supports the preservation and protection theory of sleep?

Comparing animals' sleeping habits to their eating and hiding habits, it was concluded that many animals complete their primary tasks of feeding and finding a safe spot for themselves and their young; the remaining time only means danger for them. Therefore animals who prey and hide during the day sleep at night, and those that forage during the night sleep through the day.

FQ.22: What evidence supports the body restoration theory of sleep, and what are some limitations of the theory?

Animals that need to maintain their body heat and have fast metabolisms tend to sleep longer to restore their worn out bodily tissues. However, from studies with birds it was concluded that the sleep times of these birds correlate to their possibility of being hunt down rather than their body size. This theory also cannot explain the large difference between grazing animals' and meat-eating animals' sleeping hours even though they have similar body sizes and metabolisms. This theory also fails to explain why some animals sleep at day while others sleep at night.

FQ.23: What evidence supports the theories that REM sleep promotes the maintenance of brain circuits?

Neural circuits need exercise, otherwise they would decay. REM sleep interrupts peaceful non-REM sleep and exercises neural circuits. This theory is consistent with the fact that the longer a person sleeps, the more phases of REM sleep they go through. Fetuses also seem to be in a constant REM sleep state for most of the pregnancy, seemingly exercising the newly created neural circuits constantly.

FQ.24: How might dreams be explained as inevitable consequences of the state of the brain during REM sleep?

Dreams have been attempted to be explained as rehearsals and recreations of the brain to cope with daily events that have posed some degree of threat, tying the fact that many dreams contain negative emotions to this theory. According to others, it is simply the motor, visual and auditory hallucinations our brain causes while it's active during REM sleep.

FQ.25: How does insomnia differ from nonsomnia? What negative consequences occur when people fail to satisfy their sleep drive?

Nonsomnia is the lack of a drive for sleep, accompanied by the ability to be energetic and cognitively able throughout the day with minimal or no sleep. Insomnia, however, is the inability to fall asleep even though there is a drive for sleep, accompanied by fatigue, decreased cognitive abilities, irritation; even

distorted perception and hallucinations as causes of extreme sleep deprivation.

FQ.26: What is some evidence that the sleep drive is affected by an internal clock, located in the hypothalamus, that can operate even without external cues?

Subjects that are deprived of a natural environment and kept in a "time-free" zone where they wouldn't be tell apart the time of the day have continued to follow more or less the same 24 hour cycle to sleep and wake up. Moreover, damage to the mentioned area has been observed to cause subjects to lose their inherent sense of time and start to sleep and wake up at random times of the day.

FQ.27: What is some evidence that the internal clock is continuously reset by daily changes in light? Through what pathway does that resetting occur?

Subjects that receive more daylight in the morning and more dim lights at night seem to sleep earlier, whereas those that receive the opposite end to have a delay in their sleep cycles. Sleep-onset insomnia patients have been treated by using blue light to stimulate the daylight and to correct the patients' sleep cycles. Apparently changes in daily lighting are perceived by a neural tract that runs from the retina to the suprachiasmatic nucleus, which regulates the circadian clock according to this input.

FQ.28: According to the definitions used here, how does emotion differ from affect and from mood?
Emotions are subjective feelings that are directed towards an object or a person. The feeling associated with an emotion, independent of an object, is called an affect. Sometimes, emotions are experienced in a free-floating long lasting manner that is devoid of an object or a person to aim; these are called moods.

FQ.29: Through what strategy did Plutchnik arrive at his model of eight primary emotions?

By analysing the words used to express emotions in English and asking people to rate pairs of emotion labels to be closely related or synonymous, Plutchnik concluded that there were 4 main opposing pairs of emotions; joy and sorrow, anger and fear, acceptance and disgust, surprise and expectancy.

FQ.30: How can emotions promote adaptive ends through their motivating and communicative effects?

Emotions direct us towards a specific behaviour which can be beneficial for social connections, efficiency and social acceptancy. Some feelings are painful, indicating that it would be wiser to avoid the specific behaviour that provokes this feeling; some, opposed to the previous one, make us feel better about our efficiency and our environment, to reward and motivate us for the specific behaviour. Some, on the other hand, command us to execute a specific action for our well-being, as well as provoking some physical cues that might help us cope with the situation.

FQ: 31: What is James's theory of emotion? What evidence did James supply for the theory, and what modern evidence is consistent with the theory?

James argued that opposed to the common sense theory, which argues that stimuli induce emotions and emotions induce physical reactions, what actually happens that is stimuli causes the physical reaction which in turn induces the emotion, changing the order of emotion and reaction within the theory. James deducted from introspection that his emotions were results of his physical reactions, therefore he hypothesized that the brain would prepare the body for any situation when encountered – in times of

danger, there was no time for self-reflection and feelings – and after the emergency was over, the brain would interpret the physical reactions as emotions. Recent studies indicate that bodily changes and emotions are pretty consistent throughout the world; moreover, people who are good at detecting their bodily changes can also detect their emotional state as clearly. These facts, accompanied by recent brain imaging studies indicating that the somatosensory area of the brain becomes active both when sensing one's bodily conditions and assessing emotions, support James's theory.

FQ.32: How does Schachter's theory differ from James's? How did Schachter support his theory with experiments?

Schachter argued that the interpretation of environmental stimuli also played a big role in emotion. He pointed out that the perception of an individual about the environment defined the type of the information whereas the stimuli received defined the intensity of the emotion. He conducted an experiment by giving adrenaline to a group of subjects and placebo to the other. He then reported that all the emotions were triggered by environmental stimuli, however those who have received adrenaline were experiencing more intense emotions relative to the other group. Moreover, if the adrenaline recipients knew that they received adrenaline, the intensity at which they experienced emotions decreased. Therefore Schachter concluded that even though environmental stimuli always determined the type of emotion, it was important that the subjects attributed the emotion-enhancing effects of adrenaline to their own interpretations of the environment in order to actually experience the intense emotions.

FQ.33: What is some evidence supporting Ekman's theory that a person's facial response influences the person's feeling of an emotion and also influences the person's bodily responses to the emotional situation?

Ekman conducted experiments to support his theory that facial expressions could contribute to the emotional and physical manifestation of an emotion. He instructed some subjects that were about to watch a movie to hold a pencil with their teeth, which created a smile, while he instructed some to hold it between their lips which obstructed a smile; the smiling ones reported enjoying the movie more compared to those who didn't smile. Moreover, subjects that were instructed to contract certain facial muscles in certain ways to create various facial expressions reported that, accompanied by memories, they experienced the emotions that they were recreating even if they were not aware. Physical signals of these emotions were also recorded.

FQ.34: What is some evidence that the amygdala initiates emotional reactions to stimuli and that this effect can occur even without conscious awareness of the emotion-eliciting stimuli?

Through various studies with subjects who either had or have not had any damage to their amygdala, its activation seemed to strongly correlate to the physical and emotional reaction that the body initiated – or had not initiated. Those that had lesions to their amygdala or had it completely removed had failed to show any signs of fear or concern upon unsettling images or situations. Moreover, it was shown that neural activity within amygdala strongly correlates to physical cues of emotions. Even those who had damage in their visual and/or auditory cortices or had them completely destroyed could physically respond to frustrating images or sounds accordingly; but those who have had no problems with their visual and auditory cortices but their amygdala damaged failed to do so.

FQ.35: What is some evidence that the prefrontal cortex is involved in the conscious feeling of emotions, and that the right and left prefrontal cortices are differentially involved with different types of emotional responses?

Back in the times when a common cure for crippling emotions was prefrontal lobotomy, patients have been observed to lose their ability to properly plan and organise their lives. Since the connection between the amygdala and the prefrontal cortex has been destroyed, the prefrontal cortex no longer received output from amygdala to process and could not plan ahead accordingly. Brain imaging studies have shown that the left prefrontal cortex was involved in processing more positive emotions whereas the right prefrontal cortex was responsible of more negative feelings. The left prefrontal cortex seems to be most involved in approach whereas the right cortex handles withdrawal. Subsequent studies have shown that this relationship had more to do with the neural connections that receive and respond to these emotions rather than actually experiencing the emotions.

Chapter 6

FQ.1: How can the process of sensation be described as a chain of three different kinds of events?

Process of sensation could be broke down to three steps: physical stimulus is the first step which involves the matter or energy that affects our sensory organs; physiological response is the second step in which chemical and electrical reactions occur in order to process the sensory input; sensory experience is the third and last step in which we experience a subjective and psychological sensation or perception of the stimulus.

FQ.2: In general, how do physical stimuli produce action potentials in sensory neurons?

Physical stimuli is received by sensory receptors and they create an electrical changes to initiate neural impulses in the sensory neurons. These impulses are carried to the relevant part of the brain to be processed.

FQ.3: In general, how do sensory systems code information about the amount and kind of energy?

Sensory systems code quantitative variations – that is, about the amount of energy – as more or less frequently firing action potentials, which is interpreted as a strong or weak sense depending on the frequency of action potentials. Qualitative variations – those that differ in the kind of energy – are encoded by different sets of neurons altogether, therefore are interpreted as different sensations too.

FQ.4: What is the value of sensory adaptation? How can you demonstrate that adaptation can occur in neurons in the brain, not just in receptors?

If sensory adaptation is high, sensory receptors become more oblivious to the sensation around; when sensory adaptation decreases, the sensibility of the sensory receptors increase. This adaptation usually occurs in the receptors themselves, however in specific and regular conditions where stimuli is high, the

central nervous system can start to mediate this process as well.

FQ.5: How did Weber derive a law from data on just-noticeable differences? How can Weber's law be used to predict the degree to which two stimuli must differ for a person to tell them apart?

Weber has shown that for each sense, there was a constant proportion to jnd (just-noticeable difference) related to the lesser of two varying senses, by conduction experiments with weight and length. By assessing the proportion of jnd for each sense and applying it to the measures of the stimuli, it would be possible to asses to which degree a person would be able to distinguish two stimuli.

FQ.6: How do transduction, qualitative coding, and quantitative coding occur for the sense of smell?

Qualitative coding is determined by of which type the 400 of olfactory neurons have been activated; whereas the quantitative coding is determined by how much of these neurons have been activated by the molecules. Transduction is the process in which the molecules stick to and dissolve in the mucous fluid over the olfactory epithelium, which are then processed by the olfactory neurons in glomeruli, in the olfactory epithelia.

FQ.7: How do we smell foods that are already in our mouths, and what evidence indicates that smell contributes greatly to flavor?

Some molecules of foods we are eating are carried to the nasal cavity through an opening called the nasal pharynx, and there are subjected to the same "smelling" process as any molecule that we inhale from our nostrils. Distinguishing between tastes is hard when the nostrils are pinched close; because the air in our mouths exits from the nostrils while we chew or swallow, carrying these molecules through the nasal pharynx to the nasal cavity. The signals from olfactory sensors and taste receptors converge in orbitofrontal cortex, making them inseparable components of our experience of flavour.

FQ.8: How do sex, age, genetic differences, and experience affect sensitivity to smells?

Females have been found out to have greater olfactory abilities than males. Young adults seem to have superior olfactory capacity relative to older adults, since the sensitivity of the nose decreases by age. Genetic predisposition plays a large role in this context; some chemicals can be smelled by people who possess specific genes, and these genes can alter how the smell is perceived as well. People can gain olfactory experience and become more sensitive in detecting and distinguishing between smells as well.

FQ.9: What is the evidence (a) that people can identify other individuals by smell; (b) that mothers can identify the scents of their infants very soon after birth; and (c) that infants quickly learn to identify their mother's scent?

According to studies, parents can distinguish their children's scent, siblings can distinguish each other's scent and strangers can distinguish each other's scents pretty quickly. A study in a maternity ward showed that mothers, only by interacting with their new-born babies for 10 to 60 minutes, could distinguish the clothing that their baby wore. Another study conducted with babies has shown that even in the first week of their lives, babies have reacted significantly to the scent of their mother's breast pads; they were also able to distinguish their own mother's breast pads between identical looking breast pads that were worn by various new mothers.

FQ.10: From an evolutionary perspective, why might mice prefer to mate with others that smell most different from themselves? What evidence suggests that it might be true for humans?

Studies conducted with mice have concluded that by picking those that smell the most different from themselves, mice reduce the chance that their mate is a genetic relative, and contribute to the genetic variability of their offspring. The prospects of finding a proper mate and avoiding incest has been tested on humans as well. These studies shown that women who have not been using hormonal contraceptives have preferred the scent of physically symmetrical and typically more attractive men; also when they were in the middle of the menstrual cycle, the peak of fertility in women. Opposed to these subjects; women who have been using hormonal contraceptives and were in low-fertility times of their menstrual cycles have not had specific preferences among the proposed male scents. According to other studies, family members can distinguish between each other's scents; moreover, member pairs that, evolutionarily, had the highest risk of incest mating, such as siblings of opposite sexes, mothers-sons and fathers-daughters, were aversive towards each other's smells.

FQ.11: What human anatomical characteristics are consistent with the possibility that we produce and respond to pheromones? What observations and reasoning suggest that we do not produce sex attractant pheromones?

Some of our scent secreting glands are placed in strategic areas of our bodies and secrete personalised scents; we also seem to possess at least a rudimentary ability to perceive pheromones. However, studies have shown that there were no specific scents that were particularly attractive to any of the subjects. Other than a usual variance and occasional fancying of a scent, there wasn't a specific scent that seemed to serve a specific purpose. This shouldn't be surprising, as many of the pheromone secreting animals mate in particular times of the year or their lives; we humans do not have particular periods in time that increase our sexual drives, therefore there is no need to advertise our readiness to mate with our scent.

FQ.12: How does transduction generally occur in taste?
The chemical substance dissolves in saliva and comes into contact with the sensitive ends of appropriate taste receptor cells. There, it triggers electrical changes that result in changes in action potential first in the taste receptor cells and then, by synaptic transmission, in sensory neurons that run to the central nervous system and the brain.

FQ.13: What are the six primary tastes? How, in general, does transduction occur in taste receptor cells?

Six primary tastes identified are sweet, salty, sour, bitter, umami and fat. The taste cells have sensitive extensions which trigger the taste cells to produce action potentials, which in turn induces action potentials in the taste sensory neurons which reach the brain through synaptic transmission.

FQ.14: From an evolutionary perspective, (a) what is the function of each of the primary tastes, (b) why do so many chemically diverse substances taste bitter, and (c) why does bitter sensation increase in women during pregnancy?

These primary tastes direct us towards pleasant and necessary substance and distances us from harmful, toxic and dangerous substances. Some of the chemicals are not edible, and some animals and plants have adapted to concentrate toxic content in their bodies to not be eaten; therefore our taste receptors

have evolved in such a way that we taste harmful chemicals as bitter, and therefore avoid them. Women are usually more sensitive to tastes than men; but they become much more sensible during pregnancy since fetuses are highly sensitive to even low toxic substance, and the infant's life is also at stake in case the mother consumes any toxic substance.

FQ.15: In what ways is pain a "body" sense, and a drive? How does observation of people born without pain sensitivity illustrate pain's value?

Pain, unlike most other senses, can be perceived by every part of the body and derives not from the perpetrator of the pain but from the injury or damage itself that is causing pain. Pain has its own physical manifestations and facial expression as an emotion. As a drive, it ensures that we move away from the cause of pain and refrain from behaving in such ways that we might get hurt in the future. People born without the feeling of pain often get preventable injuries just because they did not feel the pain that came before or during the injury; they also often die at young ages due to severe damages, tissue deterioration and infections. This case demonstrates us the evolutionary explanation and importance of the sensation of pain.

FQ.16: What is the anatomical basis for a distinction between first and second pain?

Two distinct types of pain transmitting fibres – namely C fibres and A-delta fibres – exhibit structural differences. C fibres are thin, unmyelinated and they conduct slowly; whereas A-delta fibres are highly myelinated, thicker and conduct fast. Therefore, the "first pain", the sharp, immediate one is transmitted by A-fibres, and the "second pain", the late, longing, dull, burning one is transmitted by the C fibres.

FQ.17: What are three different components of pain experience, and what evidence links these to three different portions of the brain?

The first, sensory component is perceived by somatosensory cortex, which is also responsible for processing input from touch and heat. The somatosensory cortex describes the quality and intensity of the pain, and also locates the pain on the body. The second component is the primary emotional and motivational component of pain, is experienced immediately, and is dependent on the cingulate and insular cortices. People with damage to these areas apparently experience "asymbolia for pain", which describes the full and complete perception of pain but not being bothered by it, accompanied by a lack of escaping pain. The third one is the secondary emotional and motivational component, which is the worry caused by the pain, as well as the concern for the meaning of the pain and its future. This aspect is managed by the prefrontal cortex which is responsible for planning and concern for future. People with damage to this area feel the pain and avoid it for this instance, but are oblivious to the possible meanings of the pain.

FQ.18: How does illness produce a general increase in pain sensitivity, and how does injury produce localized increase in pain sensitivity?

During illnesses, especially with fever, it is hypothesized that the body increases sensitivity to pain in order to keep the patient stable and safe, to be able to preserve energy to fight with the sickness. After injuries, the sensory neurons in the injured area become much more sensitive because of the chemicals released from damaged cells. This increased sensitivity is perceived as intense pain in the injured area. This mechanism is likely to have evolved to motivate the individual to protect the injured area.

FQ.19: How can pain input be inhibited at its entry into the central nervous system, and how might endorphins be involved in this process?

Neurons in the PAG (periaqueductal gray) send their axons down to inhibit pain input. Electrical stimulation of PAG has strong analgesic effects. Some endorphins are produced in the central nervous system, and some of them alter the sensibility of the neurons they bind to. Endorphins are believed to act both in PAG and the stimulated area to inhibit pain.

FQ.20: What is some evidence that stress-induced analgesia is at least partly mediated by endorphins?

Subjects that have been injected with chemicals that block the production and distribution of endorphins fail to display stress-induced analgesia upon any threats, whereas their endorphin secreting counterparts did display this kind of analgesia.

FQ.21: What is some evidence that pain can be reduced by belief?

In some cultures, mere belief and faith have been observed to reduce individuals' pain during various ceremonial actions. In others, people who have been treated with placebo pills reported less pain than others who have not received a placebo. In the latter, the effects of placebo were severely undercut if the patients received endorphin blocking treatment prior to placebo, which may indicate that endorphin secretion enables belief-induced analgesia.

FQ.22: What are the functions of the outer ear, middle ear and inner ear?

The outer ear collects and transfers the physical sound, the air pressure, through the ear canal to the eardrum (tympanic membrane). The eardrum vibrates the three ossicles – anvil, hammer, and stirrup – vibrate and push against the oval window – another membrane on the other side of the middle ear. The ossicles also amplify the pressure they receive from the eardrum by almost thirtyfold and transmit it to the oval window. The inner ear transduces the sound from the oval window, and the cochlea is here. Between the two portions of the cochlea there is the inner duct, which has so-called "hair cells" that connect to auditory neurons that run up to the brain.

FQ.23: How does transduction occur in the inner ear?

The sound induced vibration of the ossicles against the oval window initiates vibration to the fluid in the outer duct of the cochlea, which produces an up and down waving motion of basilar membrane. The tectorial membrane, which runs parallel to the basilar membrane, does not move as the basilar membrane moves. Between these two membranes are many little hair cells with many hairs on them. Whenever the basilar membrane moves towards the tectorial membrane, these hairs are bent. This bending causes tiny pores in the cell membrane to open, which induces a change in the electrical charge across the membrane. This in turn causes each hair cell to release neurotransmitter molecules at its synapses upon auditory neurons, increasing the rate of action potentials in those neurons.

FQ.24: How do two kinds of deafness differ in their physiological bases and possible treatment?

One kind of deafness, called conduction deafness, is caused by rigidness is ossicles, and can be treated by a hearing implant which amplifies the sound so that it could be transmitted to the cochlea through the bones in the face or the middle ear. The other kind called sensorineural deafness, however, may be stemming from damage to hair cells and/or auditory neurons. If the damage is to the hair cells, a

cochlear implant that acts as a transducer via permanent wires implanted to the cochlea, where it stimulates the neurons directly, can greatly improve one's hearing capacity. If the case is the latter, a cochlear implant would not be of help.

FQ.25: How does the travelling-wave theory explain the pattern of hearing loss that occurs as we get older?

As we get older, our ability to hear high frequency sounds deteriorates. According to the travelling-wave theory, this might be because that the portion of hair cells responsible for coding high pitched sounds receive all kinds of sounds whereas the cells responsible for coding low pitched sounds only receive low pitched sounds.

FQ.26: How does the timing of action potential code for sound frequency? How do cochlear implants produce perception of pitch?

For sounds below 4000 Hz, the rate in which action potentials occur also contributes to the pitch of the sound. Cochlear implants break sounds down to different frequency ranges and distribute them accordingly on the basilar membrane, with regard to both the proportion to which the signals are given and to what frequency are they given at.

FQ.27: How is tone frequency represented in the primary auditory cortex? What evidence suggests a close relationship between musical pitch perception and visual space perception?

The primary auditory cortex contains tonotopically organised neurons that are equally and maximally responsive to sounds, but their order within the cortex differs by which pitches they process. Spatial perception and pitch perception abilities are highly correlated; those who score poorly on a test involving distinguishing different pitches also score poorly in visual-spatial tests. We are inclined to call high-pitched sounds high, and low-pitched sounds low, because of an apparent relationship between auditory and visual-spatial perception.

Chapter 7

FQ.1: How might sophisticated eyes like ours may have evolved from primitive beginnings?

In some ancient animals, photoreceptors became concentrated in a spot under the skin. By developing through generations, they have developed the ability to react to shadows as well. The skin covering these eye-spots became transparent to enable clear vision and let in more light. These receptor accumulations then moved deeper, inside liquid filled cavities to reduce glare and enable the animal to detect the direction the light is coming from. One of the membranes covering the eye became thicker to form a lens, which magnified the light falling onto the photoreceptors. This lens later became capable of reflecting shapes and images onto the photoreceptors. Enhancement of these organs, along with proper nervous adaptations, have created our advanced visual ability.

FQ.2: How do the cornea, iris, and lens help to form images on the retina?

The cornea helps focus the light that passes through it. The iris, thanks to its muscle fibres, can change the diameter of the pupil, the hole in the middle of the iris, to let more or less light inside. The lens adds to the focusing process, but changes its shape depending on the distance of the focus to adapt better.

FQ.3: How are cones and rods distributed on the retina, and how do they respond to light?

Cones are more concentrated in the fovea area, where the reflection of vision primarily falls. Further from the fovea, their concentration decreases. The exact opposite is the case for rods; they exist everywhere in the retina except fovea. Cones are specialised in detecting acute vision in brightness; rods detect vision in dim light.

FQ.4: How do rod vision and cone vision differ?

Cone vision allows us to have a bright and acute vision of our surroundings during day; rod vision gives us a more vague vision but enables us to tell important details apart in dim light or darkness.

FQ.5: What is the chemical basis for dark adaptation and light adaptation? Why do we see mostly with cones in bright light and with rods in dim light?

Photochemical of rods, rhodopsin, are much more sensitive to light than photochemicals of cones. Intense light causes rhodopsin to break down, rendering the rods inactive. Therefore, we see entirely with cones in bright light. In dim light, rhodopsin regenerates in around 25 minutes to activate rods again and allow dark vision. Cone photochemicals go through the same process as well, but exhibit much, much smaller changes than that of rods.

FQ.6: How does the trichromatic theory explain the three-primaries law? How was the theory validated by the discovery of three cone types?

Trichromatic theory argues that three different types of receptors are responsible for detecting light belonging to different portions of the wavelength spectrum. This theory would automatically affirm the three-primaries law, and the theory, as well as the law are indeed correct, confirmed by the discovery of three different types of cone receptors which are responsible for detecting different wavelengths.

FQ.7: Why does vision in some people obey a two-primaries law rather than the three-primaries law, and why are these people not good at picking cherries? How does the color vision of most nonprimate mammals, and that of most birds, differ from that of most humans?

A defect in the gene responsible for the production of photochemicals can cause the lack of these chemicals, therefore to a condition called colour blindness. These people have difficulty distinguishing colours ranging from green to red (500-700 nm) and therefore would not be able to distinguish red cherries among green leaves, relying on colour. Most nonprimate mammals have only two types of cones and have hardships at distinguishing upper wavelength colours. In contrast, most birds have a fourth type of photoreceptor which allows them to see ultraviolet light since they rely heavily on sight during flight, hunting and feeling; their hatchlings have ultraviolet mouths so their parents can distinguish them from afar.

FQ.8: How does the opponent-process theory explain (a) the law of complementarity in color mixing and (b) the complementarity of afterimages?

Since that some colours – complementary ones, when mixed, won't produce a new one but get paler and closer to white, Hering attempted to explain physiological structures that are either inhibited or excited according to the wavelength; and complementary colours would produce opposite effects on these units. These receptors get fatigued when looking at a stable image for a long time, and when the vision is directed onto a neutral surface – like a white sheet of paper – the fatigued pair of complementary receptors does not respond immediately, causing us to see the negative coloured afterimage of the previous one; this creates the complementarity of afterimages.

FQ.9: How has the opponent-process theory been validated in studies of the activity of neurons that receive input from cones?

Apparently the eye really contains three different types of cone cells, which reaffirms the first theory; however these cones feed into the ganglion cells in a pattern that translates the trichromatic code into an opponent-process code. These ganglion cells become excited or inhibited according to the wavelength fed to them, and their complementary colours.

FQ.10: How can you know what an infant sees? What methods can be used to determine visual acuity in young babies?

Babies have not fully developed the ability to accommodate their lenses, look with both eyes at the same focus or follow moving objects with their eyes; however they catch up to each and all of these adaptations within 6 months. Even before these dates, babies have been observed to react differently to sufficiently different visual stimuli, and to look at it more when presented with a new one. These observations have led us to try babies' visions with different patterns (bull's eyes vs. checkerboards etc.) to see how they discriminate between them. Also, rectangles with black lines or complete gray filling is shown to them to measure how much time they spend looking at each, to assess if the baby is able to distinguish the lines from another and therefore spends more time looking at the lines rather than the rectangle.

FQ.11: What are experience-expectant processes, and how do they relate to the development of vision?

Infants of varying species are born with pre-set expectations as to what kind of stimuli they will receive; and they adapt and develop according to this stimuli. If they are deprived of necessary visual stimuli, they have visual impairments varying in degree of reversibility. If these processes are not interrupted, the postnatal visual development is advanced and completed healthily.

FQ.12: What kinds of stimulus features influence the activity of neurons in the primary visual cortex?

The colour, shape, contouring, angle, movement and its relation to the background determine the neurons that become activated.

FQ.13: What is the difference between parallel processing and serial processing? What role does each play in Treisman's feature-integration theory of perception?

Parallel processing occurs as a part of detection of features. This occurs instantaneously and on all the stimulus array. Primitive individual features are picked up separately. The integration of features involves serial processing, which occurs sequentially, at one spatial area. Individually picked up features are joined together here.

FQ.14: How do pop-out phenomena and mistakes in joining features provide evidence for Treisman's theory?

Pop-out phenomena indicates parallel processing, which makes it easy to detect one single difference primary features no matter how many distractors there are. However, when two or more features are joined and a single distinct object is the target, it takes longer to find it, which indicates that the joining of these features involve serial processing. Moreover, when people are presented with simple shapes for brief moments, they can memorise all the basic components; however they sometimes confuse which features belonged together to form a single object. This indicates that parallel processing can occur in

such brief time but serial processing takes more time and conscious effort.

FQ.15: What are some principles of grouping proposed by Gestalt psychologists, and how does each help explain our ability to see whole objects?

Principle of proximity describes our tendency to see accumulated objects as a part of a larger object. Principle of similarity involves stimulus elements that are similar or different; the similar ones are perceived as parts of the same object whereas different ones are distinguished. Principle of closure describes our tendency to perceive overlapping pierced or half forms as complete ones, and ignore the gaps in the borders. The principle of good continuation involves the grouping of intersecting lines as single, smoother, longer ones rather than disconnected or sharply bent ones. Principle of common movement describes the tendency to perceive singular elements moving at the same speed to the same direction as parts of a whole larger element. Principle of good form describes our tendency to perceive rather symmetric objects as singular ones whereas asymmetric forms as overlapping or conjoined more simple shapes. All these principles help distinguish, integrate, analyse, follow and derive meaning from forms and shapes we see to create meaningful images in our heads.

FQ.16: How do reversible figures illustrate the visual system's strong tendency to separate figure and ground, even in the absence of sufficient cues for deciding which is which?

Reversible figures indicate our tendency to derive rather comprehensible figures from unusual elements we are presented with, as an act of decision to perceive one object or the other depending on present cues even if they aren't sufficient. Our perception oscillates between the alternatives – perceiving one element as the main figure and the other as the background and vice versa – to derive a meaning from what we are seeing.

FQ.17: How do illusory contours illustrate the idea that the whole influences the perception of parts? How are illusory contours explained in terms of unconscious inference?

Illusory contours are actions of our brain done to infer meaning from an unusual setting of elements, which alters our perception of the parts as well. Unconscious inference is the process that brain uses to assess meaning and presence of a possible element amongst a uniquely and unusually arranged set of elements.

FQ.18: How is unconscious inference described as top-down control within the brain? What is the difference between top-down and bottom-up control?

When responsible neurons in an area are stimulated with an input, they infer meaning from the feedback and command downwards their conclusion, which is top-down control. Unconscious inference occurs as visual input activates relevant neurons. Bottom-up control is stimulation of the neurons directly by the input and not higher parts of the brain as it is in top-down control.

FQ.19: How does the existence of two types of visual deficits caused by brain damage provide support for the idea that the human brain does indeed process objects as distinct entities?

Visual object agnosia patients can describe separate elements of the object in great depth, but they cannot identify the object as a whole relying only on sight. Visual form agnosia patients cannot see the outlining and patterns of a presented object even though being aware of the object's presence and able

to perceive some of its features such as colour and brightness. These deficits are caused by damage to separate brain portions and impair different abilities of visual perception which indicates that our perception of objects is made up of separate elemental entities conjoined to derive a meaning.

FQ.20: What are the anatomical and functional distinctions between two different visual pathways in the cerebral cortex?

One of the pathways is the "what" pathway, or the lower stream running into the temporal lobe, is responsible for identifying the objects themselves. The other is the "where" or "where-and-how" pathway, or the upper stream running into the parietal lobe, is responsible for spatial localisation of the objects and arrangement of actions to properly interact – or avoid – said objects.

FQ.21: What abilities are preserved in people with damage to the "what" pathway but lost in people with damage to the "where-and-how" pathway?

Damage to this stream does not affect one's ability to perceive and identify objects as is the case in "what" pathway, however it impairs one's ability to properly locate and interact or avoid an object in space.

FQ.22: In sum, what are the distinct functions of the "what" and "where-and-how" visual pathways?

The "what" pathways allows us integrate various elements of an object into a complex, whole vision of it as well as create memories, plans and consciously identify it; the "where-and-how" pathways allows us to create and unconscious map of the space surrounding us and properly locate and interact with objects around us, such as moving around obstacles, reaching for and grasping objects etc.

FQ.23: What evidence is there that people use different psychological mechanisms to recognize faces than they use to recognise nonface objects?

Unlike everyday objects, we seem to pay special attention to faces, remember, recognise and distinguish thousands of them. We apparently use different, specialised brain areas to do so. Some distinct features and elements of a face give us an immediate perception of a face, and we can even infer faces from non face objects.

FQ.24: How does the own-race bias and its development support the idea that learning is involved in recognizing faces?

Studies conducted with babies of different races and different ages indicate that own-race bias is in fact developmental, since 3 month old babies were able to distinguish between faces of every race when given the chance to observe; and these scores kept getting lower for other races in older babies as they could not adequately identify faces of different races even though they looked at them as long as they looked a faces from their own race.

FQ.25: How did Helmholtz describe perception as a problem-solving process?

According to Helmholtz, the light reaching us is not the vision itself. The brain processes the visual cues reaching us to infer a complete image of our surroundings without our awareness.

FQ.26: How does binocular disparity serve as a cue for depth?

Binocular disparity is the difference of angle from which our eyes perceive vision. This allows us to assess the degree of parallelism between visual cues from an object, and perceive its depth according to the amount of binocular disparity; the more parallel is the visual input, the further away the object is.

FQ.27: How do stereoscopes provide an illusion of depth?

A stereoscope provides two pictures of a setting from slightly different angles, to simulate the binocular disparity of our eyes. When these images merge in our eyes, our brain recognises the fusion of the same image with different angles and the depth effect is created.

FQ.28: How does motion parallax serve as a cue for depth, and how is it similar to binocular disparity?

Motion parallax is the perception of movement of an object with respect to its background, caused by head movements. Even with one eye, this can be perceived. It is simply the change in the angle from which an object is viewed and its measure of severity with regard to the head movement. The less the object moves, the further away it is. It is similar to binocular disparity as both rely on differences in angle.

FQ.29: What are some cues for depth that exist in pictures as well as in the actual, three-dimensional world?

These cues include occlusion, the cue in which some objects obstruct other's parts and seem to be closer to the viewer than the cut image; relative image size for familiar objects, the cue that helps us assess a distance to each object depending on our knowledge about their size and how they should appear in which distance; linear perspective, the cue in which rows of objects or linear objects converge as they go further away from which we perceive distance; texture gradient, the cue in which the accumulation of objects or texture features spread out when they are closer and accumulate as they are further away; position relative to the horizon, the cue in which we assess an object's distance with regard to its apparent distance to the horizon; and differential lighting of surfaces, the cue in which we assess distance to objects with regard to their lighting.

FQ.30: Why does size perception depend on distance perception?

The size of the image of an object created in the retina is inversely proportional to its distance. Therefore the further away the object is, the smaller the retinal image gets.

FQ.31: How might the unconscious assessment of depth provide a basis for the Ponzo, Müller-Lyer, and moon illusions?

This assessment bases our illusory perceptions on our instinct to assess distance to the visuals we see, which in turn, even if falsely, gives us the perception that if one of the objects appears farther away and they appear to be the same size, the farther one must be larger than the other.

FQ.32: What is the McGurk effect and how does it demonstrate visual dominance?

McGurk effect is a demonstration of our tendency to rely on visual cues more than auditory ones and to trust vision when two senses conflict. It is basically a sound accompanied by a vision of a mouth move. If the movement and the sound match, we'll easily perceive it; but if they are different, we'll either try to derive the sound not from the sound itself but from the mouth movement, or we'll perceive a

completely different sound altogether.

FQ.33: What are the defining features of synesthesia? Might synesthesia have any adaptive value?

Synesthesia has to be involuntary, automatic, consistent, spatially extended, memorable and emotional. Synesthesia apparently contributes to the perception of high-order concepts and unusual metaphors as well as artistic creation.

Chapter 8

FQ.1: What is a reflex, and how can it change through habituation?

Reflex is a certain behavioural response to a certain stimulus. It can be changed through habituation, in which as the result of a repeated sequence of identical stimuli, the response of the central nervous system to the stimuli gets weaker by every sequence.

FQ.2: How did Pavlov discover the conditioned response?

Pavlov was actually studying the reflexes involved in the canine digestion system. He had discovered that dogs salivated differently to different kinds of foods. After some time, he noticed that some dogs salivated before receiving any food. Undermining it as an experimental error in the beginning, he then realised that this response could be studied within the physiological realm.

FQ.3: After his initial discovery, how did Pavlov systematize the process of conditioning, and what names did he give to the relevant stimuli and responses?

Pavlov systematised the conditioning process by introducing a stimulus – a bell – along with the food given to the dog. The bell, before being paired with the food, was a neutral stimulus. The food was an

unconditioned stimulus, and the salivation was an unconditioned response. After pairing, the bell became conditioned stimulus and salivation became conditioned response.

FQ.4: How can a conditioned response be extinguished? What evidence led Pavlov and others to conclude that extinction does not return the animal to its original, untrained state?

When the conditioned stimulus was repeatedly presented without the unconditioned stimulus, the subject responded less and less to the conditioned stimulus, and not at all in the end (extinction). However, after some time without any stimuli, the subject had its conditioning seemingly restored; a phenomena now known as spontaneous recovery. After a single pairing of conditioned and unconditioned stimuli, the subject again quickly restored its conditioning and conditioned response reached its peak again. Neuroimaging studies conducted afterwards have shown that neurons responsible for conditioning and extinction were different and neurons responsible for extinction inhibited those of conditioning. The conditioned stimulus was able to revive conditioned response by activating conditioned neurons again.

FQ.5: How can generalization in classical conditioning be abolished through discrimination training? How can discrimination training be used to assess an animal's sensory capacities?

If the actual conditioned stimulus was presented along with the unconditioned stimulus whereas the similar stimulus was presented without unconditioned stimulus, the subject gradually stopped to respond to the similar stimulus. By bringing the actual stimuli and the similar one closer and only rewarding bringing the unconditioned stimuli after the actual conditioned stimuli, it is possible to assess to which degree the subject can distinguish similar sensory stimuli.

FQ.6: How do we know that generalization in classical conditioning can be based on the meaning of a stimulus, not just on its physical characteristics?

Experiments conducted on humans have shown that when they are conditioned to salivate to words, they salivate more to stimuli that share similar personal interpretations – meanings – rather than physical characteristics.

FQ.7: What were the characteristics of early, North American behaviorism? Why were Pavlov's findings on conditioning particularly appealing to behaviourists?

This kind of behaviourism tried to explain behaviour within a relation of environmental stimuli and response, without involving mental processes. Pavlov seemed to present a process of learning based on a stimuli and a response, which suited behaviourism.

FQ.8: How did Pavlov's S-S theory of classical conditioning differ from Watson's S-R theory? How does an experiment involving habituation of the unconditioned stimulus support the S-S theory?

Watson's S-S theory argued that the unconditioned and conditioned stimuli were directly connected to create a certain response whereas Pavlov's S-R theory suggested that the conditioned stimuli created a mental representation of the unconditioned stimulus which in turn gave a response. A study involving rats as subjects, a loud sound and a light as conditioned stimuli and their "freezing" – standing motionless out of fear, researchers discovered that when the response to loud sound was extinct, the rats stopped responding to the light as well, which supports Pavlov's S-S theory.

FQ.9: How does the cognitive construct of expectancy help explain the ways in which conditioned responses differ from unconditioned responses?

Expectancy theory argues that subjects are conditioned to display certain behaviours which they seem suitable for the situation rather than blankly exhibiting a single trait to a conditioned stimuli. They mentally prepare themselves for the upcoming event by the behaviour displayed besides the conditioned response itself.

FQ.10: What are three conditions in which the pairing of a new stimulus with an unconditioned stimulus does not result in classical conditioning? How do these observations support the idea that classical conditioning is a process of learning to predict the onset of the unconditioned stimulus?

Firstly, the conditioned stimulus must precede the unconditioned stimulus for the subject to exhibit a conditioned response. Secondly, the conditioned stimulus must indicate the heightened probability of an unconditioned stimulus. Lastly, the subject will not be conditioned if it already has a predictor that is superior to the new stimulus. These observations indicate that the animal has to learn that it can rely on the conditioned stimuli in order to expect the unconditioned stimuli.

FQ.11: How did Watson demonstrate that the emotion of fear can be conditioned?

As the result of the famous "little Albert" experiment, Albert was conditioned to expect a loud sound whenever a rat was placed in front of him; further pairings showed us that he was also terrified of other furry animals placed in front of him (generalisation).

FQ.12: How can the appetizer effect and sudden cravings for specific foods be explained in terms of classical conditioning?

Various sensory stimuli preceding food can condition us to feel hungry as a conditioned response to the same stimuli that have become conditioned stimuli.

FQ.13: How has sexual arousal been conditioned in humans and other animals? What is the evidence, from experiments with nonhuman animals, that such conditioning promotes success in reproduction?

Various stimuli paired with sexual arousal have rendered subjects more readily available for copulation. Male quails have been observed to have a higher sperm count after being subjected to an unconditioned stimuli.

FQ.14: Why is conditioned response to a drug-related stimulus often the opposite of the direct effect of the drug?

The body gives a reflexive conditioned response to a drug-related stimuli to suppress the effects of the drug and turn the body to its normal state.

FQ.15: How does classical conditioning contribute to the development of drug tolerance? Why is it dangerous for a drug addict to take his or her usual drug dose in an unusual environment?

Environmental cues can allow the body to start the counteractive system and enable it to gradually take in more drug, increasing tolerance of the body. When the environmental cues in an addict's usual drug taking environment is absent, a large load of drugs can kick in before the body starts the counteractive process, which can be injurious or fatal.

FQ.16: How does classical conditioning help explain drug relapse after an addict returns home from a treatment center?

When the same environmental cues back home that have been associated with drug abuse, it may trigger the same conditioned processes that counteract the drug in the body, causing a desire for the abused drug.

FQ.17: How did Thorndike train cats to escape from a puzzle box? How did this research contribute to Thorndike's formulation of the law of effect?

Thorndike's cats repeatedly engaged in useless actions to get out of the box, but when they discovered that they would be set free and have access to food once they tripped the latch, they started to trip the latch sooner in every time they were placed in the puzzle box. Eventually they would immediately trip the latch the moment they were placed in the box, now that they have learned the latch would lead them to freedom and food. Therefore, Thorndike formulated the law of effect which suggests that actions that have positive effects in a situation will likely be repeated more in the same situation over time whereas those that have negative effects in a situation are less likely to occur again in the same situation.

FQ.18: How did Skinner's method for studying learning differ from Thorndike's, and why did he prefer the term reinforcement to Thorndike's satisfaction?

Instead of expecting one action from the subject, Skinner placed them in a mechanism that would allow the subjects to decide whenever they want to take an action, and if they pressed the button they would get food or water so over time the action of pressing the button to get food or water would be reinforced, whose frequency and rate can be easily measured. He preferred the term reinforcement because the term "satisfaction" suggested a mental process of liking which was against behaviourist view.

FQ.19: How do we know that people can be conditioned to make an operant response without awareness of the conditioning process? How is this relevant for understanding how people acquire motor skills?

Through experiments it has been observed that people have figured certain patterns out to reach an objective, completely unaware that they have detected the pattern. This indicates that proficiency in many cases, or an objective oriented action is usually advanced with no conscious effort of doing it better.

FQ.20: How can we use operant conditioning to get an animal to do something that it currently doesn't do?

Through a process called shaping, an animal can be operantly conditioned to do something that approximates the main objective by supplying reinforcers for each small step that comes closer to the main objective. The animal will then reach the main objective and start to perform it, where it obtains the reinforcement by nature.

FQ.21: In what ways is extinction in operant conditioning similar to extinction in classical conditioning?

They are basically the same; repeated absence of reinforcement will cause the operant response to

cease, and as such they can reappear seemingly out of thin air after some time (spontaneous recovery) and a single re-introduction of the reinforcement will immediately revive the operant response.

FQ.22: How do the four types of partial-reinforcements schedules differ from one another, and why do responses generally occur faster to ratio schedules than to interval schedules?

Fixed-ratio schedules reward an nth response, where n is the number of operant responses and is a whole number larger than one such as rewarding every fifth action. Variable-ratio schedules award a response of a sequence of responses that average a certain number, such as third and seventh for a variable-ratio five schedule. Fixed-interval schedules award each response that has a fixed amount of time in between; variable-interval schedules award every response that has around a certain amount of time in between. Ratio schedules depend on the speed action of the subject whereas interval schedules depend on a certain amount of time, therefore ratio schedules can be sped up with the response speed of the subject and occur faster.

FQ.23: How do variable-ratio and variable-interval schedules produce behaviour that is highly resistant to extinction?

Since reinforcement is strained over time towards extinction in variable schedules, subjects can be highly persistent in repeating operant responses to receive the reinforcement again. Even if the reinforcement is completely extinct, the subjects can be driven to pursue it anyway.

FQ.24: How does negative reinforcement differ from positive reinforcement?

Negative reinforcement occurs when the removal of a stimulus makes the operant response more likely to occur. Positive reinforcement occurs when the arrival of a stimulus makes the operant response more likely to occur. The difference is whether if the stimulus appears or disappears as a result of operant response.

FQ.25: How does punishment differ from reinforcement, and how do the two kinds of punishment parallel the two kinds of reinforcement?

Punishment is the opposite of reinforcement; it's any consequence that will render the repetition of an operant response less likely. Positive punishment is the arrival of an unwanted stimulus that will decrease the operant response – just as a positive reinforcement would be de arrival of a desired outcome to render the operant response more likely to occur. Negative punishment is the removal of a beneficial factor to render the operant conditioning less likely to occur – just as negative reinforcement is the removal of an unwanted stimuli that would render the repetition of an operant response more likely to occur.

FQ.26: How can an animal be trained to produce an operant response only when a specific cue is present?

By presenting a discriminative stimuli – that is, a specific stimuli besides default environmental cues that indicates that an operant response will be reinforced – animals can be trained to perform an operant response only with the presence of the discriminative stimuli because they have learned that in the absence of the discriminative stimuli, the operant response is useless.

FQ.27: How was discrimination training used to demonstrate that pigeons understand the concept of a

tree?

After they have been trained to distinguish pictures of trees as discriminative stimuli indicating that their pecking of the key will be rewarded with seeds, the pictures were replaced with new ones that the pigeons have never seen, yet they were as successful at identifying these pictures as they were with the previous set of pictures they used for five days. The pictures included whole trees and some parts; those with leaves or not; far and close; with grass or not; and different kinds, which indicates that the presence of the colour green or leaves is not the mere cue by which pigeons distinguish trees, and they must have a much more abstract and accurate depiction of trees in their minds that they were so successful at distinguishing between them.

FQ.28: Why might a period of reward lead to a subsequent decline in response rate when the reward is no longer available?

After a period of reward, the recipient might come to think that the sole reason for the completion of that action is to gain a reward and it should be done as work for a reward, not for the sake of the action itself. Therefore, when the reward is removed, there seems to be no reason for the subject to perform an action if it is not rewarded anymore. Therefore, since they view the action as a gateway to the reward and not do it for the sake of having done it, periods of rewarding might lead to a substantial decrease in the completion of the action if it's not rewarded anymore. This phenomenon is called the over justification effect.

FQ.29: How are Skinner's techniques of operant conditioning being used to deal with problem behaviours?

By rewarding an individual's correct actions, with either a certain rewarding system or social praise, and presenting a punishment for the problematic behaviour, it seems possible to have an individual distinguish between appropriate and inappropriate actions and act accordingly to the reinforcements and punishments.

FQ.30: What is Groos's theory about the evolutionary function of animals' play, and what are five lines of evidence supporting that theory?

Groos suggested that play was a way of practicing and refining species-typical behaviours that would benefit the animal in the future as an adult. Firstly, young of a species engage in playful activities much more than the adults do, because adults have already mastered the skills that the young need to learn through playing. Secondly, animals that have more to learn play more; animals that have to be swifter, faster and more skilful to survive spend more time playing opposed to animals with rather simplistic lives that don't have much to learn about. Thirdly, young animals tend to focus on playing at the skills they will most likely need as adults; most carnivores play chase, a means to hunt when they are adults, whereas herbivores play flee and dodge, a skill they'll need to evade predators; males play fight more than females and females take playful care of infants more than males. Fourthly, play allows the young to repeatedly practice the skills they'll need so they have a certain training regime that'll prepare them for adulthood. Lastly, play seems to deliberately challenge the young's abilities since they always pick play partners, environments and conditions that are increasingly more challenging.

FQ.31: How does exploration differ from play in its evolutionary function?

Exploration serves to learn about the environmental conditions and what is has to offer, whereas play strengthens internal functions. Animals that don't engage much in play still have to explore their environment.

FQ.32: How do rats explore a novel environment? How did Tolman and subsequent researchers show that rats learn useful information in their exploration?

When placed in an unfamiliar environment, rats first cower in a corner, and then start to explore its surroundings, first slowly, then boldly. After it has gained information about all of its surroundings, it'll patrolling to see if anything has changed. When a new object is placed, it'll direct its attention to the new object rather than paying as much attention to the old objects. In an experiment conducted by Tolman, it has been observed that rats that have not been rewarded for solving a maze started to solve it much more quickly once they have started to receive food for solving the maze. This indicates that during their previous trials these mice have learned about the maze and once there was a motive to quickly solve it, they did so.

FQ.33: How does observation of skilled performers help animals learn new operant tasks? How does imitation differ from stimulus enhancement, goal enhancement, and emulation?

Animals learn to imitate certain actions by observing others do it. Then they copy the technique to achieve the same result. Stimulus enhancement is the increase in attractiveness of an object that is being acted upon, goal enhancement is the increase in drive to obtain a reward identical or similar to the one observed, and emulation is achieving the same result by using different means after observation.

FQ.34: What is evidence that chimpanzees transmit cultural traditions from generation to generation?

In some isolated groups of chimpanzees, various traits concerning tool design, mating and food have been observed, and these traits are seemingly distinct to these specific groups.

FQ.35: What are two ways in which food-aversion learning differs from typical examples of classical conditioning? How do these differences make sense in terms of the function of such learning?

The first aspect that food-aversion and classical conditioning differ is the time gap between eating the food and the induction of illness. In classical conditioning, the unconditioned stimuli must be presented right after the conditioned stimuli, a few seconds at latest, whereas in food-aversion this gap can be extended up to 24 hours. Another difference is the extent of distinction between the conditioned stimuli and other similar stimuli. In classical conditioning, everything resembling the conditioned stimulus can be used as a substitute whereas in food-aversion, only the taste and smell seem to be relevant, and subjects can eat food that looks similar to the conditioned stimulus. This distinction serves as a deterrent of edible food; rotten or inedible food take time to cause an illness, and the main distinction between an edible and an inedible one is not the looks, but the chemical components that can be detected by smell and taste.

FQ.36: How has flavor-preference learning been demonstrated in humans?

When presented with a choice of foods from which one was rich in calories, many subjects initially enjoyed both equally; but in the upcoming day the approval of calorie-rich food increased whereas that of the other either decreased or hasn't changed.

FQ.37: How do rats and people learn food preferences by attending to others of their kind?
Rats can detect what others have eaten by smelling each other's mouth and preferring the food that has been eaten by the demonstrator. Humans, especially human infants, are much more likely to try a food if they have seen an adult try it first.

FQ.38: In sum, what has natural selection imparted to young omnivores about food selection?

Firstly, it would be safe to eat what the adults eat, since they have probably eaten it before and they're alive. Secondly, remembering the taste and smell of a food would be smart too since if can then be associated with an increase or decrease in health and therefore be preferred or avoided.

FQ.39: What is some evidence that people and monkeys are biologically predisposed to learn to fear some things more easily than other things?

Through experiments it has been shown that monkeys raised in labs that have never encountered a snake before do not initially exhibit any fearful reactions; however when they see another monkey react fearfully to a snake they immediately exhibit these fearful reactions too. This condition does not apply to safe or neutral objects. Human infants exhibit more or less the same traits towards stimuli that evolutionarily been deemed dangerous and unsafe.

FQ.40: What aspects of a young fowl's ability to follow its mother depend on learning, and how is that learning guided by inborn biases?

A young fowl will recognise its mother from the head as well as its sound and is able to distinguish between other organisms and their mother, but when presented with only one option to recognise as a mother –in this case, the researchers – they will register them as their mother and follow them everywhere they go. A certain time after the hatching, the fowl will not recognise anyone as their mother if they haven't been presented with one so far. Even when they are separated from their mothers in the egg and have been hatched in an incubator, they will be attracted to the sound of their species, which indicates processes that are inborn and not learned – and called imprinting. After they have registered one as their mother, they will follow it wherever it goes.

FQ.41: What is the Westermarck effect, and what evidence is there that it is based on early cohabitation?

The Westermarck effect is the sexual aversion of genetic relatives or people that have been raised together. People that don't have any genetic relations but are raised together often have no incidences of sexual attraction or intercourse; whereas people that have genetic relations but are separated when they are very young and meet as adults often report a strong sexual attraction towards each other.

Chapter 9

FQ.1: What are the main components of the information-processing model of the mind presented here?

They are the sensory memory, short-term (working) memory and long-term

memory.

FQ.2: What is the function of the sensory memory?

Sensory memory brings sensory stimuli to the brain for it to be processed through attention, if necessary. It stores all sensory input for a brief moment so that the brain can pick those worth remembering.

FQ.3: What are the basic functions of short-term store, and how is this memory store equated with consciousness? How does working memory resemble the central processing unit of a computer?

The short-term store is where all the information that has been obtained or retrieved is processed. This place is where we keep all conscious actions, thoughts, feelings, reasoning; and therefore it can be argued that this store consists of all we call consciousness. Since both a CPU and short-term store can either process recently obtained information and/or information that had already existed within the system, their functions can be considered fairly similar.

FQ.4: In the information-processing model, what are the functions of attention, encoding and retrieval?

Attention is the process which allows the flow of elements from sensory memory to short-term memory for usage and/or evaluation. Encoding is the process by which the information moves from the short term memory to the long-term memory. By deliberately memorising information we are moving them into the long-term memory. Retrieval is the opposite of encoding; it's the process by which information that has been stored for long on the long-term memory is brought to the short-term memory for usage.

FQ.5: What are the major features of "fast" and "slow" thinking?

Fast thinking is self-explanatorily fast, and effortless, unconscious, automatic, intuitive and without control. Slow thinking is effortful, conscious, deliberate, controlled, explicitly directed onto an issue or a setting.

FQ.6: What two competing needs are met by our attentional system? How do the concepts of preattentive processing and top-down control of the attentive gate pertain to these two needs?

Two attentional needs met by our system are directing all mental resources to our current focus and not being distracted by other stimuli; and monitoring irrelevant stimuli to interpret greater benefits or potential danger of another event or situation. Preattentive processing sorts irrelevant information out and lets pass only what is crucial for the task, or what could point out a potential benefit or danger; top down control gate is the commands sent to the preattentive processing gate to inform sensory memory

about what kinds of information could be relevant in the aforementioned contexts. These two functions define the purpose and inner machinery of our attentional system.

FQ.7: What evidence from research shows that people very effectively screen out irrelevant sounds and sights when focusing on a difficult perceptual task?

Through a phenomenon called cocktail-party phenomenon, we are able to separate simultaneous sensory stimuli from one another and direct our attention to only relevant ones while completely obstructing others to reach our attention. Therefore, when given a task that requires high attention to a particular sensory stimuli, we can (un)intentionally screen out some other stimuli that would be very obvious to spot out if our attention was not focused on a single task. These have been demonstrated by experiments involving simultaneously played voice records from which only one of them the subjects were supposed to listen to, but they picked some fundamental information from the other one as well; also with videos and images that have been inserted with irrelevant and absurd images. The subjects were asked to perform a specific perceptual task, and they have been observed to often miss out on the absurd element, being so concentrated on the task that they have been given.

FQ.8: How does sensory memory permit us to hear or see, retroactively, what we were not paying attention to? How have experimenters measured the duration of auditory and visual sensory memory?

Sensory memory allows us to shift our attention “back in time” to see or hear stimuli that has been ignored in real time. The ignored stimuli is still kept in the sensory memory for a short time, and if it proves relevant, the attention is shifted to it. The average duration for which we can retrospectively perceive stimuli is around 8-10 seconds for sounds and 1/3 of a second for images.

FQ.9: What is some evidence that concepts stored in long-term memory can be primed by stimuli that are not consciously perceived?

Experiments have shown that stimuli that is not consciously perceived enters the short-term store and can affect the behaviour of subjects even though the behaviour relies on long-term memory.

FQ.10: How is the concept of automatic, unconscious processing of stimuli used to help explain (a) people’s ability to do more than one task at once, and (b) the Stroop interference effect?

When effortful tasks become routines for us, the brain becomes able to devote more attention and energy to other tasks while carrying out the routine. Sometimes some of these abilities become irrepressible; reading is one of them. The Stroop interference effect is basically the clashing of the conscious action of saying out the colours of the words and the unconscious, irrepressible action of reading the words themselves.

FQ.11: What three general conclusions have emerged from studies of brain mechanisms of preattentive processing and attention?

These three conclusions are that stimuli that are not attended to activate sensory and perceptual areas of the brain nevertheless; attention magnifies the activity that task-relevant stimuli produce in sensory and perceptual areas of the brain, and it diminishes the activity that task-irrelevant stimuli produce; neural mechanisms in anterior (forward) portions of the cortex are responsible for control of attention.

FQ.12: What is some evidence that people keep information in the phonological loop through subvocal repetition?

People repeat sequences of information to keep them in their phonological loop through subvocal repetition, and the number and length of information that can be held in phonological loop at the same time is dependent on the language itself; longer and more vocal elements are harder to keep repeating than short and less ones. Since variables of elements that can affect the subvocal repetition directly affects the span of phonological loop, we can conclude that these two are connected.

FQ.13: Why is working-memory span usually two items less than memory span?

During the execution of a task, the enforcement of energy and focus required to fulfil the task competes with that remembering given input, leaving less focus and energy for both, reducing the capacity of working-memory.

FQ.14: What are three subcomponents of executive functions?

Executive functions comprise the working memory (updating), switching and

inhibition. **FQ.15: What four general conclusions have been discerned for executive**

functions?

Firstly, executive functions are both unified and diverse, in the sense that these functions show a correlation between their levels of proficiency within a subject, but this is not a perfect correlation and differences can still, and still does, occur. Secondly, there is genetic composition defining executive functions. This means that executive functions are often advancement-wise inherited from parents, more than personality and IQ is; however they can be developed through experience too. Thirdly, levels of executive functions can influence social behavioural traits as well, depending on the excessiveness or deficit in one of the executive functions can result in a specific behaviour or mental condition. Lastly, there is substantial developmental stability in executive functions, meaning if these functions were adequate in a person, they are likely to stay that way as the person grows up.

FQ.16: How does the case of Phineas Gage show that the prefrontal cortex is related to executive functions?

After Phineas Gage sustained damage to his prefrontal cortex, his abilities of planning and concern for the future as well as his actions were severely damaged and he didn't seem to be trying to hold back his opinion on anything, speaking in a careless, often rude manner without regard to the other party in contrast to his old personality, even though his intelligence seemed completely intact. This goes to show that this specific portion of the brain is an important hub for executive functions and Phineas Gage sustained damage to his inhibition function.

FQ.17: What general roles does the prefrontal cortex play in working memory?

Prefrontal cortex seems to be associated with keeping verbal or visual information in

mind.

FQ.18: What are the differences between explicit and implicit memory, and how is each memory type

assessed? In what sense are implicit memories more context-dependent than explicit memories?

Explicit memories can be consciously resurfaced and expressed, whereas implicit memories are all the nonverbal and unconscious means that affect our behaviour that we cannot consciously describe. Explicit memories are assessed through directing questions directly to the subject and they can explicitly express the memories, which is the reason it is also called declarative memory. Implicit memories are assessed through behavioural responses to certain test questions which the subject cannot explicitly answer. This is the reason why it is also called nondeclarative memory. Expressive memories can be called out on command with no regard to the context it was obtained or the setting the subject is in, however implicit memories cannot be called forth, and they generally do not exhibit themselves without the context in which they have been acquired.

FQ.19: How do the two subclasses of explicit memory differ from one another?

Episodic memories are one's own explicit memories accompanied by their thoughts and feelings at that moment, whereas semantic memories are general ideas, schemas and knowledge about life and its features themselves; they are not as personal as episodic memories are.

FQ.20: What sorts of experimental results was Collins and Loftus's spreading-activation model designed to explain? How does the model expand on the idea that mental associations provide a basis for memory and thought?

This model helps us visualise the nature of association in our minds, that terms closely associated would be tightly tied and pull each other when one's resurfaced. These mental associations both figuratively and literally trigger each other, which creates large bundles of associations consisting of themes with various degrees of association between them.

FQ.21: What are some examples of procedural memory, and why are such memories classed as implicit?

Motor skills, habits and unconsciously learned rules, such as riding a bicycle or hammering nails, can be examples of procedural memory. Moreover, an experiment was conducted in which subjects were shown sequences with certain rules without being told the rule, but the subjects still managed to correctly sort different sequences out depending on the rules that they have not even been told. These subjects – and those who perform the aforementioned tasks – cannot exactly describe how they are doing it, but are still capable of performing the tasks, which makes these memories implicit.

FQ.22: Why is priming considered to be implicit memory? What function does priming play in a person's everyday thought?

Priming is not experienced consciously, however it still links newly received sensory information to knowledge stored in the long-term memory. When this action becomes a sequence, it helps keep our train of thought in a reasonable and logical order and direction, with every new knowledge or sensory information being linked to the one before and after it. Since priming is completely unconscious, it is considered implicit.

FQ.23: How does the case of H.M. support the idea of a sharp distinction between working memory and long-term memory?

H.M. had lost his ability to form new long-term memories but he managed to sustain his previous knowledge and some primary skills relevant to memorising and using memorised knowledge. He could make use of his working memory very efficiently while given a task, however the moment he lost his attention, he forgot that he was even given a task in the first place. This vast difference in efficiency indicates a sharp distinction between working memory and long-term memory.

FQ.24: What evidence indicates that the hippocampus and temporal-lobe structures near it are involved in encoding explicit long-term memories?

Neuroimaging studies have shown that hippocampus and adjacent areas of the temporal lobe are activated when subjects are given information to keep in mind, and an increase in the activity of said areas correlates to the likelihood of the subject to remember the information for longer. This goes to show the hippocampus and adjacent areas of the temporal lobe are involved in encoding information to be stored in the long-term memory.

FQ.25: Why does infantile amnesia cease around the age of 4?

During the development of our brains, our ability to encode episodic memories develop much slower than that of semantic memories, but this imbalance ceases around the age of 4. This is also correlated to the language skills of the child at the time the memory is supposed to be encoded; as well as their self awareness.

FQ.26: How might a relative lack of episodic memory in early childhood and old age be explained? How does episodic memory seem to distinguish humans from other species?

Apparently, the prefrontal cortex develops slowly in childhood and is more sensitive, so it sustains more damage as one gets old. Episodic memories allow us to move around in time, see our past, infer now and project future, which no other living being can do.

FQ.27: What is some evidence, from the laboratory and from the classroom, that the more deeply a person thinks about an item of information, the more likely it is to be encoded into long-term memory?

Laboratory evidence is that experiments have shown that people tend to remember given words, sentences or lines more and for longer if they are made to think about and learn through its meaning in a context, rather than visual and auditory aspects alone. Evidence from the classroom is that according to results from various experiments, students who elaborate, ask questions to themselves and think on the parts they have been given to study rather than those who simply read the parts over and over again.

FQ.28: How can chunking be used to increase the amount of information that can be maintained in short-term memory or encoded into long-term memory?

Chunking both reduces the amount of information that needs to be recorded, and attributes a rather sensible meaning to the elements as well as tying them together. These encryption elements can both increase the capacity of working memory and the amount of information successfully encoded into long term memory.

FQ.29: How does chunking figure into experts' excellent memories for information that is within their realm of expertise?

Experts apparently use a distinct kind of memory called long-term working memory, which keeps information that is relevant to one's expertise in long-term memory and renders it easily accessible so it can be used to solve problems, answer questions or perform tasks that are relevant to the expertise. These elements of information are tied together much strongly if they are presented in a logical manner that would be recognised by the expert and lead to a proper new information bit that has been kept in long term memory. By keeping chunks of information closely tied within a relationship of causality, likeness etc. experts increase the rate in which they remember these information. When these problems, questions or tasks are presented in a random manner, they cannot make use of the full extent of this long-term working memory and have rather scarce results.

FQ.30: What is hierarchical organization, and how can such an organization facilitate encoding into long-term memory?

Hierarchical organisation is the structuration of relevant knowledge in an overarching order to keep them divided into folders with the most relevant information in each can be found. The information is clustered into relevant categories, sub-folders and higher order categories. By tying relevant information by one of their main features and categorising them, the process of encoding is enhanced with creation of folders and it becomes easier to extract information when it is necessary.

FQ.31: How might visualization help improve memory for verbally presented information?

Visualisation can help connect the visual memory to the verbal one, strengthening its connections and increasing the chance that it will be called forth in the future. Also, various verbal information can be bundled together as a visual to keep the same amount of information with less space in mind.

FQ.32: What evidence supports the theory that long-term memories first exist in a labile (unstable), hippocampal-dependent state – and if then, if not lost, that they are gradually consolidated into a more stable form that doesn't depend on the hippocampus?

This theory is supported by studies on patients that experience time-graded retrograde amnesia after the removal of hippocampus and with neuroimaging studies conducted with people who have intact, normally functioning brains and normal memories. These studies have shown that when recent memories are being recalled, the hippocampus is activated; but when rather old memories are called forth, the cerebral cortex is activated but not the hippocampus.

FQ.33: What might be the value of the increased modifiability of long-term memories that occurs during retrieval?

To keep certain memories pertaining to relevant, up-to-date aspects of life, these memories can be altered, modified, clipped or completely lost (forgotten) when necessary. When these memories are dormant, they are rather static; but when they are called forth it is possible to modify them to serve various purposes.

FQ.34: What is some evidence that sleep promotes the durability and quality of long-term memory?

During slow-wave sleep the hippocampus is activated which could indicate the consolidation and clarification of memories as well as gaining new insight on a problem that has previously been worked upon, specifically before sleeping.

FQ.35: What do the principles of association by contiguity and association by similarity say about retrieval from long-term memory? According to James, how does the second principle depend on the first?

Association by contiguity suggests that if two themes are logically related or have been paired throughout one's life, they would bring each other to working memory when recalled. Association by similarity is the recalling of two entities that share common aspects but haven't necessarily been paired by one in their mind. The knowledge needed to construct a complex idea and realise that a specific set of aspects pertain to both of them would come from association by contiguity; the primal construction of these complex ideas.

FQ.36: How might elaborative encoding facilitate retrieval? How is the idea supported by a memory testing experiment?

By encoding more information pertaining to the primary bit of knowledge, the chances that this information could call forth the actual knowledge gets higher as well as, especially when the suggestive information is recorded by the subject itself. The memory testing experiment divided subjects into four categories in which they either recorded one word or three words belonging to a knowledge; and when they were tested they were given either their own notes or someone else's. The results show that people who have recorded three words for each word and used their own notes during the test scored more than %90 whereas those who recorded only one word and used someone else's one-word notes could remember only around %10 of the words.

FQ.37: How is the effect of context on memory adaptive? What is some evidence that retrieval is best when the retrieval context is similar to the encoding context?

Our past experiences in a given context are often relevant to our future experiences in that context. Studies have shown that some aspects of the context in which a memory is obtained can help enhance retrieval as well, such as the environment itself or a particular stimulus that was presented during the learning.

FQ.38: What does it mean to say that memories are constructed?

Memories are not exact records of past events; they are bits of information logically connected to some extent and the remaining empty spots are filled by us regarding our previous knowledge of the world and our reasoning as to what should fill these spots. These render them constructions rather than exact recordings of our past.

FQ.39: How did Bartlett demonstrate that culture-specific schemas affect the way that people remember a story?

The way we restructure the memories we have according to our reasoning is highly subjective to our pre existing ideas of the world and its aspects in a stereotypical manner. These pre-existing standard representations are called schemas or scripts and are often used to unconsciously fill in the gaps of a memory that is being tried to be resurfaced. Bartlett demonstrated this with a study involving telling a story to university students who, when asked to retell the story later, filled in some gaps according to their understanding of the world constructed with high influence of the culture of the geography they

grew up in and are used to.

FQ.40: What is some evidence that eye-witnesses' memories, even when very confidently expressed, are not always reliable? What is some evidence that suggestions made after the event can influence eye-witnesses' memories?

Many convicted people that have later been exonerated have been falsely convicted mostly because of confident eye-witnesses. Some of these eye witnesses have been hypnotised or subjected to suggestion which altered their true memories and made them more or less certain of a sight they claim to have seen. Various studies have shown that some subtle suggestions such as signs of appreciation can increase the confidence eye-witnesses have in their testimony, and the way a question or problem is presented and phrased can also alter the answer a witness can give.

FQ.41: How have false memories for childhood experiences been implanted in experiments? What evidence indicates that imagination can facilitate false-memory construction?

By describing certain events and asking the participants to visualise the event as well as supplying them with details, researchers were able to convince some participants that they remember an event that has in fact never occurred. Instead of only thinking about it, when participants are asked to vividly imagine and visualise the event, rates of conviction among participants sharply increased, even accompanied by some details about the event that has never been enclosed to the participants.

FQ.42: How might source confusion and social pressure contribute to false-memory construction?

Source confusion can change the point of view of a memory as in who was the actual subject of the events, as well as the content. Social pressure can have people create memories by appreciating them for remembering what was asked for; or can have one doubt their real memories by suppressing their certainty and pressuring them to be convinced that they are exaggerating the event.

FQ.43: Why might differences in executive functions affect one's prospective memory abilities?

Intentions stored in prospective memory uses up cache and resources to be maintained, and poor executive functions indicate that it will be harder to maintain the memory and act on it once it's time.

Chapter 10

FQ.1: How would you construct a test to assess a person's ability to perceive analogies?

A test that has been constructed and presented is Raven's Progressive Matrices test, where visual patterns that are progressing in a specific manner are presented to the subject who is expected to complete the pattern by detecting the rule by which the patterns progress. Another one is presenting the subject with two terms that have a certain relation, and presenting them with a third one, expecting them to infer its counterpart by relying on the same relation that connects the previous two terms.

FQ.2: What is some evidence concerning the usefulness of analogies in scientific reasoning?

Analogies help us connect phenomena we encounter to other scientific findings, or those that are outside of the scientific realm altogether, to make sense of our findings and be aware of the prospects they could entail. Darwin and Kepler have made their greatest discoveries by using analogies.

FQ.3: How are analogies useful in judicial and political reasoning? What distinguishes a useful analogy from a misleading one?

In judicial and political reasoning, sides usually break down complex and large scale issues to more familiar, everyday and personal items to make them more easily comprehensible. A useful analogy is structurally similar and relevant to the original argument. Some analogies can be misleading as they contextually and structurally don't hold true with the original argument.

FQ.4: What is inductive reasoning, and why is it also called hypothesis construction? Why is reasoning by analogy inductive?

Induction is the attempt to infer principles or propositions from observations or facts that serve as clues. It is also called hypothesis construction because the inferred proposition has no concrete basis and is merely an educated guess. Reasoning on the basis of perceived analogies or other similarities can also qualify as induction, because they are also hypotheses inferred from certain observations.

FQ.5: What kinds of false inferences are likely to result from the availability bias?

If it is relatively difficult to infer from certain observations, we will automatically focus on the cues available that link the observations to the hypotheses that are easiest to access. When the brain is predisposed to a certain condition and has encountered it recently, it will perceive different cues as

pointing towards the same condition. It can both be inconsequential or important, such as medical conditions or demonstrations of public opinion on causes of death.

FQ.6: What are two different ways by which researchers have demonstrated the confirmation bias?

One way was giving subjects a sequence of numbers and having them infer the rule of the sequence by trying out different sequences that would or would not fit the rule. The second one was having people try to infer an individual's personality; whether they were extravert or introvert. The subjects asked these individuals various questions to infer their personality, but they asked questions that would support their previously given hypotheses rather than trying to disprove it.

FQ.7: How does a die-tossing game demonstrate the predictable-world bias?

In a die tossing game, there is no reliable pattern, therefore it is the safest to follow the "maximising" route and pick the colour red which makes up two-thirds of the die. However, we are inclined to look for rules and patterns that would lead us in every situation, including those where there is none, and it is possible for some to pick green sometimes as well – a strategy called "matching". Every roll is independent from each other, therefore there is no increase or decrease in the chances of rolling red even after rolling red for tens, hundreds of times. It is still the highest possibility that we will roll red, but we tend to think that if we roll red too many times, it'll turn into green at some point and we have to choose green, even though there is no pattern or rule at all.

FQ.8: How does deductive reasoning differ from inductive reasoning? How is it illustrated by series problems and syllogisms?

Deductive reasoning is the derivation of a logical consequence that definitely holds true if certain premises are met. Inductive reasoning is much less conclusive; it is mere guesses depending on various cues. Deductive reasoning can be used to infer certain results from given conditions, such as in the series problem where different sets of information are given to form a new set that holds true if the previous sets are true as well; and syllogisms where various levels of information overlap and it is possible to infer certain results – or at least a result being certainly uncertain or indeterminate.

FQ.9: What is evidence that the tendency to rely on real-world knowledge can overwhelm our deductive-reasoning ability?

According to studies conducted on university students, some syllogisms can be unintentionally influenced by our knowledge of the real world and we can subconsciously add premises for ourselves that we would consider to be true, which are not given to us in the question if we want to follow logic and logic alone.

FQ.10: To what extent is the design stance with respect to tools a limitation to human cognition or an adaptation?

Designs stance creates a certain purpose for various tools in our minds, enabling a more efficient use of it as we know what purpose the tool serves and how to enhance both the tool and our capacities of using it; but this fixed idea comes with a mental limitation that sometimes keeps us from using familiar tools that have been designated a certain function in novel situations even if they would come in handy.

FQ.11: What evidence suggests that solving insight problems is qualitatively different from deductive reasoning? How might mental priming be involved in achieving insight?

Deductive problems require conscious attention to solve and are slow effortful mental processes that correlate with working-memory capacity. Insight problems can be left unattended for some time while the brain unconsciously reorganises elements pertaining to the problem – a period called incubation period – to sometimes come up with a solution after this break time. This skill correlates with creativity as well, which has seemingly no relation to deductive reasoning skills. This goes to show that the skills required to solve these two kinds of problems are separate and qualitatively different. In an insight problem, the elements used remain primed during the incubation period which can then be associated with a different object during this time to create a solution to the problem.

FQ.12: What evidence suggests that happiness or playfulness helps to solve insight problems? According to "broaden-and-build" theory, how do positive emotions differ from negative emotions in their effects on perception and thought?

Studies conducted with students and doctors show that when they have been given a stimulus that provokes joy, they are more open minded and careful in the problems they seek to solve. "Broaden-and build" theory argues that when one is in a negative emotional state such as sadness, anger or fear, the scope through which they view the world narrows; this seems to be an evolutionary mechanism to sort out creative ways to look at the world and only use strict, previously known methods that helped in the past. On the contrary, when one is joyous and relaxed, again evolutionarily it seems to be the time for creative solutions and new perspectives to look at the world.

FQ.13: How do unschooled members of non-Western cultures typically perform on classification problems? Why might we conclude that differences in classification are based more on preference than on ability?

Non-Westerners that have not been educated in Western schools often approach these problems with practical and functional terms rather than abstract properties. They choose to categorise given elements by functionality which is found more in the real world rather than taxonomically, based on their life experiences.

FQ.14: How have researchers documented a general difference between Westerners and East Asians in perception and memory? How might this difference affect reasoning?

According to studies, East Asian students tend to focus on and remember the whole content of a given scene whereas North American students tend to remember specific prominent objects as separate entities from the background and the rest of the scenery. When asked about the scenery they have been shown, the Asians were more successful in describing the whole scenery, and the North Americans could recognise prominent entities of the scenery better, regardless of the presence of a background that has or has not been used in the animation. In another study, North American students were better at drawing a line with the exact length as shown before whereas Japanese students would draw a line with the same proportions with regard to the square it's inside of. This could indicate that North American students were taught to focus their attention whereas East Asians inclined to divert their attention. East Asians' attention to the background, context, and the image as a whole can allow them to attribute many factors to the environment and to spread them throughout the time whereas Westerners focus

more on internal assets and attributions.

FQ.15: What sorts of subtests make up modern IQ tests, such as the Wechsler tests, and how is IQ determined?

Verbal comprehension, perceptual processing, working memory and processing speed are usually measured in a standard IQ test. The average score is 100 and deviations to any direction are computed according to the bell-shaped curve known as a normal distribution.

FQ.16: How have psychologists assessed the validity of IQ tests? What are the general results of such assessments?

They have applied IQ measurements to areas that would require intelligence to render the measurements valid, and the assessments show that jobs that require complex mental processes correlate highly with higher IQs; longevity, mental and physical health and educational success also correlate with higher IQ.

FQ.17: What was Spearman's concept of general intelligence, or g? Why did Spearman think that g is best measured with a battery of tests rather than with any single test?

G is considered as the underlying element of intelligence that is common in all aspects of intelligence measuring tests, and every test partly measured g along with the distinct ability pertaining to the test, therefore the average of a series of tests would be more accurate in measuring g rather than a single test.

FQ.18: What evidence led Cattell to distinguish between fluid intelligence and crystallized intelligence?

Cattell distinguished the immediate extrapolations regarding information presented either at that moment for the first time, or knowledge that is very broad and general (fluid) from assessments made regarding previously obtained knowledge that is focused and specialised on a specific matter (crystallised) because types of knowledge correlated within each cluster instead of between them; and abilities to utilise fluid knowledge and crystallised knowledge did not develop and decay in a parallel manner throughout life, indicating that they are better identified as separate entities of g.

FQ.19: What findings have revived Galton's idea of mental quickness as a basis for general intelligence?

After some studies in various literature have found correlations between response time in both adults and children with intelligence, Galton's idea was revised and applied as "inspection time" – the time an individual needs to look at two object to consciously distinguish them – as a measure of intelligence.

FQ.20: How might executive functions provide a basis for individual differences in intelligence, and how might mental quickness affect that capacity? What evidence supports this logical possibility?

The strength of executive functions might be the variance in which people acquire and process new information. Mental speed allows more information to be processed faster, allowing working memory to be capable of handling new work load at any time. Level of intellectual impairment correlates to low efficiency in executive functions. Also, it has been argued that people who perform well on executive functions are more efficient in directing their mental sources to a task, and these functions are often

signs of intelligence; therefore higher control of executive functions also correlates with higher intelligence.

FQ.21: What reasoning suggests that general intelligence is an adaptation for dealing with evolutionarily novel problems?

We humans face a lot of novel problems, both throughout our individual lives and evolutionary line, and intelligence allows us to compare patterns and see analogies to solve problems we have encountered for the first time by using what we had and what we have at that point.

FQ.22: What is the difference between the absurd form of the nature-nurture question and the reasonable form? Why is one absurd and the other reasonable?

The absurd form is distinguishing nature and nurture from one another and asking which one contributes to intelligence, however there could be no intelligence unless both of them were present; therefore a more sensible way of asking this question is to what extent nature and nurture contribute in the creation of a certain trait.

FQ.23: How is heritability defined? Why would we expect heritability to be higher in a population that shares a similar environment than in an environmentally diverse population?

Heritability is the measure of how much of the difference in a trait between persons stems from genes as opposed to environment. If a group of people share the same environmental conditions, this means the way the environment affects the trait must be more or less the same, therefore differences in these traits can be attributed to genetic differences.

FQ.24: What is the logic of comparing identical and fraternal twins to study the heritability of traits? What difference is observed between identical and fraternal twins in IQ correlation?

Twins have more genetic components in common, and it gives us a clearer view of the nature-nurture problem to study these pairs of twins between each other as well as their own separately raised counterparts. Identical twins have greater correlation between their IQs than fraternal twins.

FQ.25: How can IQ heritability be estimated using the correlation coefficients for the IQs of identical and fraternal twins raised together?

Correlation of fraternal twins is subtracted from correlation of identical twins and multiplied by two to have an estimate for heritability.

FQ.26: How can IQ heritability be estimated by studying identical twins who were adopted into different homes?

Since the environments in which they reared wouldn’t be any more similar than that of unrelated people, the estimate of correlation coefficient between identical twins that are raised apart is itself the heritability coefficient.

FQ.27: How can a person’s rearing environment influence the heritability of IQ?

A study has shown that heritability between adults siblings were pretty much equal, but educational level of their parents can affect the heritability vastly, as to cause a difference of almost .50 between

siblings with highly educated parents and siblings with not highly educated parents.

FQ.28: What is the evidence that the effect of a shared family environment on IQ correlations is lost in adulthood? How might this loss be explained?

Apparently, even in identical twins, correlations between IQs are lost when entering adulthood. If genetic components are more similar, the difference will be less, but will occur anyway. This can be explained by the fact that into adulthood, individuals get to pick their own environments and be influenced by their own choices. Genetically similar siblings could tend to have similar tastes for social environments which could explain the relatively small decline in their IQ correlations.

FQ.29: What evidence suggests that intellectual involvement can increase a person's fluid intelligence over time?

According to studies conducted with people from various occupations and ages, it has been shown that depending on a person's involvement in intellectual activities as well as their job demands, they can experience an increase or decrease in the flexibility of their fluid intelligence.

FQ.30: Why can't heritability coefficients found within groups be used to infer the source of differences between groups?

Heritability coefficient within a group only refers to the variability in one group, and does not have a relation with another one. One can say that it is not valid to measure between-group differences with heritability; this does not measure what is intended to be measured.

FQ.31: What evidence suggests that the average IQ difference between black and white Americans derives from the environment, not genes?

It is impossible to categorise a person as "black" or "white" depending on their skin pigmentation; the ancestries of people deemed "black" can vary as much as "whites" or other races. A study was conducted to see if there was any correlation between ancestries of "black" children and their scores on an IQ test, and there was no relation between the two at all.

FQ.32: What is stereotype threat, and how does it explain differences in IQ between white and black Americans?

Stereotype threat is the involuntary compliance of an individual with the negative stereotypes that its minor community has been attributed. When minorities are told that the task they need to perform concerns intelligence, they tend to score significantly lower. Also, some argue that IQ tests are biased as they are aimed to measure intelligence that is deemed useful and meaningful by the majority, but not the minority. When culture-typical cues in intelligence measuring tests are removed and participants are given rather neutral tests, the difference substantially decreases.

FQ.33: What evidence suggests that the status of being an involuntary minority may be particularly detrimental to IQ development?

According to studies, past or present social and/or cultural outcasts that are still implicitly or explicitly being implied their inferiority perform poorly compared to the majority that deem them inferior, however when their environment changes and they are in a majority that treats them equal to

themselves, their rates of success substantially increases.

FQ.34: How does history provide further evidence that IQ is highly susceptible to cultural influence? On which measures has IQ increased the most?

Over the years, average scores on IQ tests got higher and is now modified periodically to keep up with the standards of the generation. Even though these increases have occurred everywhere, the most substantial increase has been with tests directed towards fluid intelligence, which is free of cultural expressions and are least affected by cultural differences.

FQ.35: How might the historical increase in fluid intelligence scores be explained?

Improvements in our living conditions, educational systems, use of technology, job demands shifting to intellectual areas, mass media and widespread access to new information have collectively increased in our general engagement in activities requiring fluid intelligence and therefore increased our IQ.

Chapter 11

FQ.1: What are the three phases of prenatal development and what are the major milestones of each phase?

The first phase is zygotic (germinal) phase, and the milestone here is that the sperm fertilises the egg and the zygote starts its journey to the uterus. The second phase is embryonic phase, characterised by development of the embryo's major organ systems. The last phase is the fetal phase, during which the growth and refinement of organs and body structure occur.

FQ.2: When is the unborn child most susceptible to the effects of teratogens and why?

Between the 3rd and 8th weeks of conception, the organ systems and limbs of an unborn develop the fastest, which is the time that they are most vulnerable to the effect of teratogens.

FQ.3: How might prenatal experience "prepare" a fetus for postnatal life?

The psychological and physiological conditions of the mother as well as the stimuli received from the outside can be used as a forecast by the fetus, and it can shape its physiological and psychological aspects according to the conditions it will most likely face after birth.

FQ.4: To what extent do different parts of the body develop at different rates? Why might this be so?

Lymphoid systems grow very rapidly and they reach over the adult dimensions by age 12, then again decrease in development as the individual gets older. Brain and head keep developing steadily until around 10-12 years where they reach adult sizes. Rate of increase in height substantially increases around 10 years of age until almost 20, and reproductive organs show little development until around 13-14 years of age after when they substantially increase their development, reaching adult levels at around 20. For the puberty to initiate, the lymphoid system needs to develop substantially to support all the hormonal changes as well as the physical and mental development throughout the period, therefore they occur in different rates at different times.

FQ.5: How has the emergence of different aspects of puberty changed over historical time, and what is responsible for these changes?

Even though age of menarche has not substantially decreased since 1960s, the age which breast development starts keeps decreasing, being as early as 9 years of age. These changes can be attributed to various chemical components found in pesticides, medicine, fire retardants as well as tobacco, alcohol and obesity.

FQ.6: How does infants' behaviour reveal that they are actively exploring their environment with their eyes and that they remember what they have seen?

Babies apparently look longer to new objects than familiar ones, suggesting that they put in effort to learn what they are looking at. They also exhibit habituation towards patterns after some time of looking at them, and dishabituation towards new ones replaced with the old one. When they are presented with both, they look more at the new one, to understand it more. They also remember the stimuli they have seen before. These extrapolations show us that infants, starting from a very early time of their lives, actively explore their surroundings, distinguish stimuli and remember having seen them, obtaining new knowledge.

FQ.7: How does infants' behaviour reveal that they are motivated to control their environments and are emotionally involved in retaining control?

Infants pursue control of the initiation and termination of stimuli rather than the stimulation itself. They exhibit more interest and joy in engaging in stimuli that is in their control, and they exhibit sadness and anger when the control is taken from them, even though the stimuli is present. After some point babies use their mouths, and then their eyes and hands together to acquire information about their surroundings, and this is a natural behaviour during which the focus of the infant is hard to break.

FQ.8: How do infants, beginning before 12 months of age, use their observations of adults' behaviour to guide their own explorations?

By observing the gazes of adults, babies learn to name their surroundings which are of interest and greater importance. They also focus on what adults focus on, look when pointed to an object and point at object the adults are not looking at or searching for. They also learn to associate happenings with adults' behaviour and intentions. They also interpret adults' facial cues, especially their parents', as directives for their behaviour; if they interpret fear or anger, they refrain from a behaviour, and if shown joy or interest, they engage in the behaviour.

FQ.9: What is the violation-of-expectation method for studying infants' knowledge of physical principles? With this method, what have researchers discovered about the knowledge of 2- to 4- month olds?

This method presents a possible and an impossible physical event and measure the infants' attention towards them. Apparently, even 2 to 4 month old infants have a concept of physical rules of the universe and show much greater interest to the event that should have been impossible.

FQ.10: How did Jean Piaget test infants' understanding of object permanence? What might explain the

discrepancy between Piaget's results and the results of selective-looking experiments?

Jean Piaget hid a toy under a napkin that has been followed by eyes by the infant, and when the toy disappeared under the napkin the infant lost interest in it. They were still looking at the general direction at which the toy disappeared, but did not take actions to retrieve it. Experiments conducted with older infants show that the concept of object permanence has been set but very fragilely; these infants could retrieve the toy under a napkin but when the toy is put under a new, second napkin, they picked the old one again, suggesting that infants of this age rely on their experiences with the object rather than the sensory input. Selective-looking experiments can undermine this phenomenon since the selective-looking experiments rely solely on observation whereas Piaget's tests relied on motor functions as well, for the infant to be able to coordinate the limbs to complete the actions required to retrieve the hidden object.

FQ.11: What evidence suggests that self-produced locomotion promotes rapid development of infants' search abilities?

Infants who are able to move independently gain a whole new perspective of the nature of objects around them as well as new abilities pertaining to their motor function skills and their coordination with sensory input, which greatly contributes to their abilities to retrieve a hidden object.

FQ.12: In Piaget's theory, how do schemes develop through assimilation and accommodation?

New actions are incorporated into schemes through assimilation, and the scheme in turn expands or changes its structure to suit the new action or change in the scheme, a process called accommodation.

FQ.13: What is Piaget's "little scientist" view of children's behaviour? How is it illustrated by the examples of an infant playing with containers and by an experiment with preschool children allowed to play with a two-lever toy?

Children tend to examine objects that they partially understand and want to explore more, to be able to assimilate the new actions, but also in a manner that would still require accommodation to ensure their mental development. When an infants is stacking objects and comes across a container in which another object drops, the child will test the container to assimilate the new information and accommodate it within his existing schemes. In the experiment, children were shown a box with two levers which produce different effects; for some the levers were pressed simultaneously and for some separately. The conclusion was that the children who have seen the levers be separately pressed knew the effects produced and were no longer interested in the box because there was nothing that they could learn from it, whereas those that have been shown the simultaneous pull of the levers seemed much more interested in the toy since they didn't know which effect which lever produced, and they still had more to discover about this toy.

FQ.14: In Piaget's theory, what is the special value of operations?

Operations greatly contribute to a child's understanding about the reversibility of actions and basic principles of physics.

FQ.15: In Piaget's theory, what are the four stages and the stages roughly associated with each?

The first phase, the sensorimotor stage, lasts through the first 2 years of life. The second, preoperational stage starts from 2 years of age and lasts until 7. The third phase is the concrete operations stage which exhibits itself between the ages of 7 and 11, and the last, formal operations stage starts from 11 and lasts until 16.

FQ.16: What are two ways, other than reversibility of operations, that preoperational and concrete operational children differ?

These children differ in some other traits as well, such as centration versus decentration. Apparently, preoperational children lay their attention on the most prominent feature in their environment, which is named centration, whereas concrete-operational children can focus their attention onto other consciously chosen aspects of their environment, which is decentration. Another aspect in which these classes differ is egocentricity, which is the tendency of preoperational children to perceive the world as everyone perceives it through their own eyes; concrete-operational children are able to perceive different points of view.

FQ.17: Why do many of today's developmental psychologists doubt Piaget's theory of stages of mental development?

Further studies conducted indicate that the stages Piaget described could overlap with training or due to the nature of the problem the child is presented with, and the distinction between these stages were much more blurry than Piaget anticipated. Also, recent studies have concluded that very young infants can still exhibit abilities Piaget attributed to much older children.

FQ.18: How does Vygotsky's perspective on cognitive development differ from Piaget's?

Whereas Piaget emphasized on physical environment, Vygotsky focused on the social environment and its effects on development.

FQ.19: What is Vygotsky's concept of tools of intellectual adaptation? How can such tools influence the course of cognitive development?

These tools are the ones provided by the social environment such as those that we write with or write on, calculate and record information with etc. as well as the abstract tools that are symbols in the form of letters and numbers that make these abstract concepts somewhat processable in our minds.

FQ.20: How might the number words of Asian languages help children learn the base-10 number system more easily than American and European children? What evidence suggests that they do learn the base-10 number system earlier?

The number words in English sometimes do not give enough clues as to what they represent, but in Asian languages these words have very clear meanings and even facilitate the solution of the problem because the result becomes obvious even when you say the problem out loud. Experiments have shown that Asian children grasp the technicality of base-10 system much earlier than American and European children as they are able to distinct between blocks representing 10 and 1 much more effectively whereas American and European children struggle and only use a great number of blocks representing 1.

FQ.21: How might being a "digital native" influence how children today learn to think?

As stated in previous chapters, digital resources are so abundant that the new generation has been accustomed to obtain information using these resources, and we use primarily these resources to access any information we need.

FQ.22: What is the "zone of proximal development", and how does it relate to children's cognitive development?

This zone comprises of the activities and tasks the child can accomplish with company but not alone. Their behaviour within this zone best promotes their mental development.

FQ.23: How does Vygotsky's "apprentice" view of child contrast with Piaget's "scientist" view?
According to Vygotsky, mental development is not accomplished for the sake of it; the main goal is to fit into the society in which the child grows. Every child gains new information and skills that will help them pave their way from basic roles to greater and more complex achievements, which depend on the cultural norms and societal structure of the social environment the child rears in. Therefore, opposed to being a "scientist", children are apprentices who gain proficiency in the various tasks they accomplish, which they learn from the elders of the society.

FQ.24: What is information-processing perspective on cognitive development, and how does it differ from Piaget's and Vygotsky's perspectives?

This perspective offers the changes in basic machinery of a child's mind as the basis for cognitive development, as opposed to Piaget's theory based on interaction with physical environment and Vygotsky's theory of social interaction.

FQ.25: Through what developmental steps do young children develop the capacity to form episodic memories?

It seems that the ability to form memories and thoughts into words is a crucial element for keeping memories in mind. Children who can express verbally their thoughts and memories can remember them for longer, and children who elaborate on these thoughts and memories with another person, preferably an adult that can elaborate on the thinking and provide the child with the proper words, tend to remember them correctly more than those who don't.

FQ.26: How do executive functions and speed of processing change with age during childhood and early adolescence? How might working-memory capacity depend on speed of processing?

Executive functions tend to advance as one grows, the individual being gradually more able to use their working memory, inhibit their behaviour and thoughts and switch between different tasks. Speed of processing allows more information to be processed faster, therefore the advancement of working memory depends on the speed of processing.

FQ.27: What do children younger than 3 years old understand about other people's minds?

These children can evaluate persons and objects as different entities, and can identify the desires, emotions and thoughts of other persons they get to observe. They can comprehend that these people can have different thoughts, opinions and experiences than them, and can act accordingly.

FQ.28: What evidence suggests that children younger than age 4 usually do not understand that people can hold false beliefs? Why might false beliefs be particularly difficult for young children to understand?

Studies suggest that when children are asked to identify a false belief they often fail and respond with the actual truth instead. Since false beliefs are both true, in the mind of the believer, and factually false, it is inherently contradictory and therefore is harder for these children to comprehend.

FQ.29: What logic and evidence suggest that engagement in pretend play, especially in role-play with other children, may help children acquire an understanding of false beliefs?

It would be sensible for pretend play to contribute to the understanding of false belief since it involves the general acceptance of a false claim and acting accordingly. The difference is that in pretend play the children are aware that the premises do not match with reality. Research has shown that children who engage in pretend play more are capable of understanding false beliefs, especially those who have a sibling that they can always interact with in such manner.

FQ.30: How does research on people with autism support the premise that the understanding of minds and the understanding of physical objects are fundamentally different abilities?

Research conducted has shown that children with autism are able to perceive representations of physical objects but cannot properly comprehend others' minds and certain premises, indicating that these abilities are fundamentally separate.

FQ.31: How does research on autism support the idea that an understanding of false beliefs may derive, in part, from prior engagement in pretend play?

Children with autism, as stated, have a poorer understanding of others' mental processes and pay little attention to them; they also do not imagine objects as having imaginary functions and engage with them only regarding their primary and real function. This behaviour prohibits the exhibition of pretend play, which in turn affects the understanding of false beliefs in these children.

FQ.32: What are the universal characteristics of morphemes? How do morphemes differ from nonverbal signs?

Morphemes are the smallest meaningful units of a language. They are arbitrary and do not necessarily bear any similarity to their meaning, so new ones can be invented and used easily, opposed to nonverbal signs that have a certain meaning that it is linked to through similarities.

FQ.33: How can any sentence, in any language, be described as a four-level hierarchy? How can rules of grammar be described in relation to that hierarchy?

The top level is the sentence itself, which can be broken down into phrases, which can be broken down into words, which can be broken down into phonemes. Grammar rules in general regulate the combination of elements that would constitute a new and proper level. Grammar includes phonology, rules regulating phonemes; morphology, rules regulating combination of morphemes to form words; and syntax, rules regulating the order of words to create a meaningful sentence.

FQ.34: What does it mean to say that knowledge of grammar is usually implicit rather than explicit?

Even though we are able to speak our native languages correctly, abiding the rules of the language, most of us cannot properly state according to which regulations we form our sentences. We also can distinguish between sentences that make grammatical sense and those that don't, but again cannot explain properly how we are able to make this judgment. Information pertaining to the use of language has been implicitly learned throughout observation and practice, and we cannot explicitly describe them.

FQ.35: How have researchers shown that very young infants can distinguish between subtly different speech sounds? How do infants' abilities to distinguish among such speech sounds change during the second half-year of their lives? What is the value of these changes?

Research conducted with infants of different ages have shown that infants will often try to produce sounds and lose interest whenever they listen to the same sound for long, which is renewed when a new sound is introduced. After the 6th month of life, infants start to improve their ability to distinguish between sounds that are considered different in their native tongue and lose their ability to distinguish between sounds that are considered same in their native tongue.

FQ.36: What is the distinction between cooing and babbling? What are the reasons for thinking that these vocalizations are precursors to language production?

Cooing is more universal, with every baby regardless of native language or hearing ability cooing in more or less the same manner. The same goes for initial babbling as well, but afterwards babbling substantially becomes language specific, and deaf children start to babble with their hands. Babbling seems to be an indicator of early language perception since, unlike cooing, babbling becomes increasingly language specific with the baby trying to imitate sounds it hears in the environment.

FQ.37: What is evidence that babies begin to understand words well before they begin to speak?

Studies have shown that babies tend to show more interest to objects and people whose name have been uttered, and apparently they can follow simple commands as well. Before uttering their own words, they already have a small lexicon consisting of various words.

FQ.38: How do young children make the link between new words that they hear and appropriate referents in their environments?

Some implicit cognitive tendencies and abilities help them acquire new words; shared attention, directing their attention to wherever an older person is directing theirs; mutual exclusivity assumption, the assumption that a novel word they hear should refer to an unknown object or animal rather than being a synonym for a previously known word; syntactic bootstrapping, the ability to infer meaning from a sentence containing an unknown word by the possible relations of other elements indicated by the other words in the sentence.

FQ.39: What are two reasons why children might overextend common nouns that they have learned?

A child might distinguish one prominent feature of the reference object and overextend its name to whichever object that carries the same feature as it, sometimes because it is internally defined with that feature, and sometimes because the child basically doesn't know what the object's name is, so it associates it with a similar object.

FQ.40: How do children demonstrate knowledge of grammatical rules in their early speech? How do some of their "mistakes" in grammar confirm that they know the rule and are not just mimicking?

Children often apply a grammatical rule they have learned to every word they utter. Even if there are mistakes caused from the word being irregular from the point of view of that specific grammatical rule, this generalisation and self-generated application of the rule to words confirms that the child actually knows the rule and are genuinely applying it to their speeches.

FQ.41: How did Noam Chomsky link the study of grammar to psychology? What did he mean by a language-acquisition device?

In his book Syntactic Structures (1957), Chomsky refuted the belief that language was like a chain whose links became triggered with the activation of a previous one, and characterised grammatical rules as the fundamental properties of our minds and emphasised on the hierarchical structure of language and the cognitive equipment required to process language in these multiple levels. The language-acquisition device he identified indicates our inborn understanding of universal grammar – a foundational grammatical accumulation that is shared by all the languages – and our inborn mechanisms, guiding us through the unique and intricate grammatical rules of our own language.

FQ.42: How have studies of creole languages and studies of deaf children in Nicaragua supported the idea that children invent grammar in absence of a pre-existing grammatical language?

Transformation of pidgin languages lacking grammatical structure into creole languages that have had consistent grammatical rules imposed to them by the speakers show our pre-existing tendency to form and understand grammar. Deaf Nicaraguan children have also invented a sign language without any prior knowledge of grammar by incorporating their innate understanding of language to the signs they have used before, which also indicates that children are able to understand grammar and create a new one in its absence as an inborn function.

FQ.43: What evidence supports the view that grammar is learned more readily in early childhood than later in life?

Not only that people who learn a new language after the critical period (first 10-11 years) usually never fully grasp the language and always have an accent or grammatical flaw; those who have never learned a language in the critical period cannot learn a language afterwards as proficiently as a native language would be.

FQ.44: How do parents in our culture modify their speech to infants?

Parents modify their speech to render it more understandable for infants by emphasising on salient words, using a larger vocal range, constructing rather simple and short sentences, use gestures and mimics.

FQ.45: What evidence suggests that differences in the language environments provided by parents can affect the rates at which infants acquire language?

Studies have found that children with more responsive mothers that lead a back-and-forth conversation with them develop language skills much earlier than those who don't have such a mother. Even though

further research indicates that the genetic similarity correlates more to the speed of language development than does the behaviour of mother, the responsive and verbally active mothers undeniably contributed to the speed at which infants learn language.

FQ.46: What light has been shed on the LASS by cross-cultural research?

Apparently, as long as the child is able to observe a certain amount of spoken language, there is no need for motherese and they are able to learn the language at more or less the same speed all over the world.

FQ.47: What is the distinction between simultaneous and sequential bilinguals?

Simultaneous bilinguals learn both languages at the same time and in an early stage of their development, in the critical period. Sequential bilinguals learn and become proficient in a language after they've mastered their first, usually later in development – after the critical period. Studies have shown that neurologically speaking, the learning processes are different between sequential and simultaneous bilinguals and different brain areas are used to speak the second language.

FQ.48: What are some of the costs and benefits of bilingualism relative to speaking only one language? Do you think the costs outweigh the benefits?

Apparently bilingual children do not have as large of a lexicon as monolingual children, and later in life they have more hardship retrieving words from long-term memory compared to monolingual people. However, the advantages include higher proficiency in executive functions, ability to efficiently switch between tasks, cultural sensitivity, recognition of phenomena and delay in decaying of executive functions, which in my opinion could outweigh the costs of being a bilingual.

Chapter 12

FQ.1: What was Harlow's procedure for studying attachment in infant monkeys, and what did he find?

Harlow presented young rhesus monkeys with two surrogate mothers, one of which was made of wire and the other had soft cloth on it. They both provided milk for the young, however all of the young chose the cloth covered mother, which indicates their tendency to bond emotionally with a mother.

FQ.2: According to Bowlby, what infant behaviors indicate strong attachment, and why would they have come about in natural selection?

Infants usually found more comfort and expressed joy with novel persons or environments when their mother was present, and expressed distress when their mothers were absent. This was evaluated to have come about to keep the child under adult supervision and away from danger, especially in novel environments.

FQ.3: From an evolutionary perspective, why does attachment strengthen at about 6 to 8 months of age?

This is the point in life where self-produced locomotion starts. A baby moving around independently would be in more danger than a baby that stays put wherever it was left, therefore the young exhibit a stronger attachment to the mother.

FQ.4: How does the strange-situation test assess the security of attachment?

A study involving a mother, an infant and a stranger can be used to assess four different types of

attachment depending on infants' reactions when the mother comes into the room where there is the infant and the stranger.

FQ.5: What evidence suggests that sensitive parenting correlates with secure attachment and subsequent emotional and social development? How did Ainsworth interpret the correlations, and how else might they be interpreted?

Studies conducted have suggested that children respond to their mothers' sensitive care with great consistency, and this connection establishes a general model for the child to set a basis for its future relationships. Ainsworth has determined that children with secure attachments to their mothers were more self-confident, emotionally secure and more able to solve problems in daily life. This kind of relationship could be viewed as a "multivitamin" that prevents problems and helps development.

FQ.6: What experimental evidence supports the theory that sensitive care promotes secure attachment?

Studies conducted with babies of an easily irritable temperament has shown that sensitive care of the mothers has undeniably contributed to the establishment of a secure attachment with 62 % of the babies having secure attachments as opposed to 22 % of the babies in a control group. Also parental training for foster parents has shown that sensitive care contributes greatly to the established relationship and the child's behaviour.

FQ.7: What evidence suggests that some infants are relatively invulnerable to negative effects of insensitive parenting?

A gene has been found to effect the nature of child-mother relationship, and children who are homozygous for the long type allele of the gene are less sensitive to negative effects of insensitive parenting and can bond with their mothers regardless of the parenting type.

FQ.8: What are some differences in the way cultures care for young infants?

In non-Western, hunter gatherer societies, infants are constantly cared for and almost never leave physical contact with their mothers or other women and relatives. They are never left to cry alone and often have access at will to a breast from which they can feed. These children have been observed to grow to become extraordinarily cooperative and brave.

FQ.9: What observations suggest that hunter-gatherers are highly indulgent towards infants? What parenting styles distinguish the !Kung, Efe and Aka?

The !Kung children are almost always in contact with their mothers; the Efe children are in direct contact with their mothers for about half of the day and with caregivers, relatives and unrelated people for the rest of it; and the Aka infants are in contact with their fathers for about %20 of the time and the fathers get up with them at night. These children are never left unattended and never left with an unsatisfied need, opposed to the less indulgent Western parenting styles.

FQ.10: According to Hoffman, how does empathy develop during infancy and early toddlerhood?

During infancy, empathy is still egocentric and reflexive, which means that the individual seeks comfort for themselves when others are in discomfort, and it is often not a controlled behaviour. Over time, the

infant seeks to comfort the other individual in discomfort, and it is often accompanied and executed by conscious thought, which proves useful at around age 2.

FQ.11: What evidence suggests that young children naturally enjoy giving? How do the !Kung use that enjoyment for moral training?

Studies conducted with children varying from 12 and 18 months of age have shown that kids spontaneously give objects and toys to others, regardless of their familiarity and whether if they asked for it or not. Additionally, studies conducted with children between 18 and 30 months of age has shown that they like to help adults with chores and tasks, especially if they seem to be struggling with the task. The !Kung infants were observed to exhibit the same behaviour.

FQ.12: At about what age and under what conditions do children share?

Children share at every age but in different proportions and with different motives. Children with 1.5-2 years of age consider the desires of the other party when distributing resources, and they seem to be aware of unequal distributions in case it occurs but are less likely to speak up if they get the lion's share. 3 years old have been also observed to share almost every time if the reward has been granted through cooperation.

FQ.13: What is overimitation, who engages in it, and why might it be adaptive?

Overimitation is the exact copying of a sequence of actions exhibited to complete a task regardless the necessity of each individual step. Practically a wide range of people from 3 year olds to even adults overimitate what they see from a model. This might stem from the fact that children tend to see adults as intentional agents, a means to learn what they want to achieve, and they trust their judgment and actions during the completion of a task.

FQ.14: What evidence is there that children learn new skills from watching other children?

According to studies, when children are represented with a novel task and asked to complete it, only a few succeeded; however when one of the children is taught the solution all the other children also succeeded by learning from the one child that knew the solution.

FQ.15: What are four general parenting styles psychologists have identified, and how do they affect children's psychological development?

Authoritarian, authoritative, permissive and neglectful parenting styles have been identified. Children with authoritative parents are often more successful both academically and professionally, they are sociable and emotionally and mentally more healthy. Children with authoritarian parents often have low self-esteem and poor academic and they are more likely to be rejected by their peers. Children with permissive parents often have aggression issues and are impulsive, action out of control. Children with neglectful parents often tend to exhibit sexual promiscuity, antisocial behaviour and substance abuse, as well as internalisation of problems such as depression.

FQ.16: How do observations of two Mexican villages illustrate the role of playing in transmitting cultural skills and values from one generation to the next? How might play promote cultural advancement?

Some of the plays the children have exhibited were more or less the same, but one of the villages prided themselves with the lack of aggression and violence whereas in the other it was part of the daily life, therefore children of the latter village have been observed to engage in serious and play fighting more than the children of the other village, which indicates that children plays are influenced from their environment as to whether a particular action would be perceived as a necessary skill to master. Renovations and lifestyles introduced to a society would be embraced by the children as well, and they would be advanced primarily in the form of play, as demonstrated by the introduction of computers to households.

FQ.17: What ideas did Piaget and Vygotsky present concerning the value of play in social development? What evidence supports their ideas?

Piaget and Vygotsky have argued that play was a way for children to learn about social and moral rules and to act according to them as well as inhibiting their behaviour to suit the role that they have been assigned with; and research has shown that children get a better grip of social and moral rules if they speak about it or play with their peers than their parents, and children who engage in fantasy plays where they are assigned with a role that requires them to inhibit certain behaviours have been more successful at social competence and self-control.

FQ.18: What features of age-mixed play may make it particularly valuable to a child's development?

When children with varying ages play together, it is less competitive because both older and younger children know that they have nothing to gain from competing with each other since the results are already clear. Moreover, the younger children learn from the older children and the older children develop skills at nurturing and use their own knowledge to help the younger ones.

FQ.19: What are some of the ways that girls and boys are treated differently by adults in our culture, and how might such treatment promote different developmental consequences?

Parents are more likely to talk to their daughters and jostle with their sons; assist and comfort their daughters with their problems more than their sons; give direct commands to their sons than their daughters; think that sciences and maths aren't as suitable for girls as they are for boys; and explain the underlying mechanisms of some machine to their sons more than their daughters. This behaviour might produce more affectionate and sociable girls and more self-reliant and independent boys.

FQ.20: How do children mold themselves according to their understanding of gender differences?

When they acquire a basic understanding of gender differences, boys and girls act in manners that clearly demonstrates their gender. When completing a task, they often do it in a deliberately different manner than the other sex does and they generalise the information that they acquired from a member of the opposite sex to the whole sex.

FQ.21: What function might children's self-segregation by gender serve? In our culture, why might boys avoid playing with girls more than the reverse?

In these segregated plays, both genders practice the functions and skills that are considered appropriate for their gender. The notion that males are superior to females have exhibited itself in the fact that those males who play and spend time with females are not as approved as girls who play and spend time with

boys are, therefore males avoid engaging in “girlish” activities, more than girls avoid engaging in “boyish” activities.

FQ.22: In what ways can girls’ and boys’ peer groups be thought of as separate subcultures? Why might differences in boys’ and girls’ play be greater in age-segregated settings than in age-mixed settings?

Boys engage in more competitive activities where they try to demonstrate their superiority to one another whereas girls engage in more cooperative activities where cooperation is the key, which could be considered as subgroups separate from another. Since competition in an age-mixed group is lower than it is in an age-segregated group, the motive for competition is reduced and these two “worlds” can interact more in this setting.

FQ.23: What is the typical nature of so-called adolescent rebellion against parents?

Although many adolescents have reported that they are more or less at peace with their parents, some conflicts between the teenager and his/her parents can occur over different views of personal independence and self-image as an adult, accompanied by the parents’ worries regarding the more novel aspects of this new era of life – sex, alcohol, drugs, automobiles etc.

FQ.24: What evidence suggests that peer pressure can have negative and positive effects? What difference in attitude about peer pressure is reported to exist in China compared to the United States?

According to studies conducted in China and US, peer pressure is viewed positive by parents, educational advisors and adolescents, since academic achievement is highly valuable in China and adolescents encourage each other to be successful. The situation is usually the contrast in US, with rare validation of academic success within and among groups of adolescents.

FQ.25: What are two theories about how adolescents’ segregation from adults might contribute to their recklessness and delinquency?

One of the theories that adolescents, through actions viewed as pertaining to adults, try to get into the adult world by the means they have known; the other is that the reason adolescents act this differently could be that they are trying to fit into their own sub-culture of peers, who will be the adults of the future.

FQ.26: How have Wilson and Daly explained the recklessness and delinquency of adolescent males in evolutionary terms?

Throughout human history, risky behaviour and recklessness has earned males social statuses and demonstrated strength. These individuals, who had genes that promote this behaviour, were also more attractive for females, which might have enabled the passing of the gene to the offspring, to this day.

FQ.27: How did Kohlberg assess moral reasoning? How can his stages be described as the successive broadening of one’s social perspective? How does research using Kohlberg’s system help explain adolescent idealism?

He assessed moral reasoning through a set of stages, in which every successive stage is the broadened

version of the previous one in terms of consideration for others around the individual and societal or universal rules and their morality. Research conducted with regard to this system has indicated that very few people get to the fifth stage, and often people stop at third or fourth. One being engaged in moral philosophy doesn't necessarily mean that they are a moral person, but the correlation between the two seems to be strong.

FQ.28: What correlations have been observed between sex education and rates of teenage pregnancy?

Sex education increases the use of condoms and other birth control methods, therefore significantly

decreases the rate of teenage pregnancies.

FQ.29: How can the sex difference in desire for uncommitted sex be explained in evolutionary terms?

This difference can be explained by Trivers' theory of parental investment. Males invest less into the offspring than do females, and they have a higher chance of copulating in a specific amount of time than do the females as well. Therefore males are often more eager to engage in sexual intercourse without emotional attachment than females who are around the same age as them.

FQ.30: How can sexual restraint and promiscuity, in both sexes, be explained as adaptations to different life conditions? What evidence suggests that the presence or absence of a father at home, during childhood, may tip the balance toward one strategy or the other?

In environments where sexual promiscuity in males is prevalent, females also tend to act promiscuously since it wouldn't be a sensible strategy to wait for a faithful partner. In environments where fidelity is prevalent, females tend to find – and stick to – a single partner as well. The presence of a father demonstrates to both males and females that a father cares for his partner and children, therefore both sexes tend to be faithful and seek for a faithful partner. The absence of a father can indicate that the father is not responsible for caring for his family, therefore this can trigger sexual promiscuity in both sexes, with the reasons being that such a role model has been perceived for males and that males are generally perceived as untrustworthy and it is useless looking for a trustworthy one for females.

FQ.31: How is romantic love like infant attachment? What evidence suggests continuity in attachment quality between infancy and adulthood?

Characteristics of the two relationships are somewhat similar, with close physical contact, caressing, long gazes into each other's eyes, cooing and childish talk, and the sensations of exclusivity and irreplaceability. The classifications of attachments of children to their mothers and partners to one another is classified similarly, and there is a correlation between people's descriptions of their relationships with their parents and romantic partners.

FQ.32: What are some characteristics of happily married couples? Why might marital happiness depend even more on the husband's capacity to adjust that on the wife's?

Happily married couples often view each other as their best friends and confidants besides from being a romantic partner, define their relationship with regard to both of them instead of explaining individually, express more often their individual commitment to the marriage and their willingness to work for its

sake, and argue much more constructively and less hurtfully. In unhappy couples, the wife responds to the husband's unspoken needs more than the other way around, because from childhood girls are better at responding to the emotional needs of others than boys, therefore the husband might need to adjust themselves to respond to their partner's needs.

FQ.33: What evidence suggests that the type of job one has can alter one's way of thinking and style of parenting and can influence the development of one's children?

A large study conducted with employees has found that workers who move from jobs with less self directing aspects to those with more have developed psychologically relative to other workers. Their view of the world and life became more sensible and flexible, their styles of parenting shifted from authoritarian to a more democratic manner, and their children have grown to be more self-directing than children with authoritative parents.

FQ.34: What difference has been found between husbands' and wives' enjoyment of out-of-home and at-home work? How did the researchers explain that difference?

Apparently, husbands felt more relaxed and happy when they were working in their houses and wives were more content when they worked outside. This difference could stem from the fact that working out of the house is widely considered as the responsibility of husbands and therefore feels like a duty, and working inside the house – often with chores – is considered the wives' job to do, therefore it feels like a duty as well, and both parties enjoy working in an environment where the job they do doesn't feel like a necessary responsibility or a burden.

FQ.35: How does the socioemotional selectivity theory account for elderly people's generally high satisfaction with life?

It seems like the older one gets, the less they see the need to give up their present comfort for future gain, therefore they are generally more content, since they realise that they don't need the benefits of long term sacrifices anymore.

FQ.36: How might selective attention and selective memory contribute to satisfaction in old age?

Selective memory and selective attention allows the old adults to remember mostly positive events in their life and evaluate new happenings in a more positive manner with less regard to the negative happenings or negative aspects of events. Therefore they are generally more positive and content than younger adults.

Chapter 13

FQ.1: In what sense are people natural psychologists?

We can naturally understand the psychological world, ourselves and those around us; even with no professional education we are able to make accurate predictions and extrapolations about other people's behaviour.

FQ.2: What evidence supports the existence of a person bias in attributions?

Studies indicate that when making attributions to a person, people often ignore the particular situation they are in or the basis of their behaviour and manner of expression, and instead attribute the behaviour mostly to the individual.

FQ.3: Why is the person bias often called the "fundamental attribution error"? In what conditions does the bias most often occur?

There was so much evidence supporting the person bias that it was called fundamental attribution error

to indicate the prevalence and significance of the bias as well as that it underlies various social and psychological phenomena. If people are occupied, busy with other tasks or tired, and when they are explicitly instructed to judge people based on behaviour, they tend to exhibit the bias more.

FQ.4: What logic and evidence suggest that the person bias may be a product of western culture and may not exist in Eastern culture?

For years the only studies about this phenomena were conducted in North America and Western Europe which raised the question whether this was part of the Western culture, and subsequent research has indicated that people within Eastern cultures are more inclined to consider the particular situation a person is in before judging, whereas US citizens, especially adults, tended to attribute the behaviour to the personality of the individual. One explanation towards this difference can be that Western cultures approve of mostly personal independence whereas Eastern cultures promote interdependence among people.

FQ.5: How have researchers documented biasing effects of physical attractiveness on perceptions of personality?

According to research, people tend to believe that more attractive people have higher social skills, and are more intelligent than less good looking people; and more often than not ugly people are more likely to be blamed and punished harshly compared to good-looking people.

FQ.6: How have researchers documented biasing effects of a babyish versus a mature-looking face? What practical consequences have been shown to result from this bias?

Apparently, baby-faced individuals are perceived as more naïve, helpless, honest, kind and warm than did mature-looking people. These people are less likely to be accused of intentional wrongdoing, since the judging people were having a hard time imagining them in these situations, but their baby-facedness did not affect the rate of their convictions of negligence and/or incompetence. Studies have shown that people are inclined to perceive mature-faced people as more competent and responsible, and these results have actually correctly predicted election results.

FQ.7: What evidence suggests that strangers who meet on the Internet like each other more than do strangers who meet in person? How might this phenomenon be explained?

Studies indicate that people who meet on internet first tend to have positive images of each other and their positive impressions often increase when they meet face-to-face. People who meet face-to-face from the beginning do not experience a change in the impressions they have of each other in the following meetings. Apparently the anonymity and the lack of visual and auditory input the Internet provides helps decrease social anxiety and people can reveal their true selves more comfortably through Internet.

FQ.8: According to Cooley, what is the "looking glass" with which we evaluate ourselves?

It is our inferences of what others think of us based on their reactions to us, with which we build our own concept of self-image.

FQ.9: What are Pygmalion effects in psychology, and how were such effects demonstrated in elementary school classrooms?

Pygmalion effects or self-fulfilling prophecies are the changes in one's self-perception and capabilities induced by others' expectations and images of them. This phenomenon has been demonstrated by school children, among which some were chosen by random, were suggested to be special, and this expectation of the teacher has actually shown itself in increased intelligence and academic success in these particular children.

FQ.10: What is the sociometer theory of self-esteem, and what evidence supports it?

This is the theory which indicates that our self-esteem works like a meter that informs the rate at which we would be approved by those around us. Supporting evidences include that people's self-esteem correlates with their estimates for their approval rate by their environment; increases with social acceptance and decreases with rejection; was effected more from test results if the results were to be published than kept private.

FQ.11: What is some evidence that people construct a self-concept by comparing themselves with a reference group? How can a change in reference group can alter self-esteem?

In a group of people, every individual describes themselves with a trait that distinguishes them from the rest of the group. In accordance with the changes observed in the reference group or the change in the whole status quo can change a person's self-image depending on the aspect of the group the person compares themselves with.

FQ.12: What are two means by which people build and maintain inflated views of themselves?

One of them is the self-serving attributional bias, which is our tendency to attribute our successes to ourselves and our failures to other persons and circumstances. The other is selective long-term memory, which is the phenomenon in which we remember mostly positive things about ourselves and seemingly erase the negative ones.

FQ.13: What is the difference between implicit and explicit attitudes in their manner of influencing behaviour?

Explicit attitudes are determinable by our own conscious statements whereas implicit attitudes can be inferred from our pre-existing associations between concepts. The more we think of what we are doing, the more the source of the effect on our behaviour shifts from implicit to explicit attitude.

FQ.14: How does cognitive dissonance theory explain people's attraction to some information and avoidance of other information?

People have a tendency to avoid information that conflicts their previous beliefs and cherry-pick those that confirm them, which is basically the mechanism underlying cognitive dissonance.

FQ.15: How does the cognitive dissonance theory explain why people are more confident of a decision just after they have made it than just before?

When we make an irrevocable decision, cognitive dissonance kicks in and eliminates our doubt to make us more comfortable and in peace with the decision we've made.

FQ.16: In theory, why should the insufficient-justification effect work best when there is minimal incentive for the action and the action is freely chosen? How was this theory verified by two classic

experiments?

Low incentive for the completion of a task means the control of free will, and this effect should work best in this case for the person to be able to justify their actions that seemingly contradict their beliefs; by changing what they believe. In one experiment, students were asked to complete various boring tasks, and were offered money to recruit new students; those who have been offered a smaller amount of money later remembered the tasks as more fun, since the reinforcement they received was not strong enough to make them recruit new student but they did anyway. In another experiment, students that were given the option to choose if they want to state their opinion on a matter or not shifted their views regarding the topic of discussion to positive more than the students that were instructed to state their opinions without a chance to decide not to do so.

FQ.17: What is the distinction among public, private and implicit stereotypes? What are two means by which researchers identify implicit stereotypes?

Public stereotypes is what we state to our environment about our thoughts of a group, private stereotypes are those that we do not state but still think to ourselves. These two are considered explicit stereotypes since the person holding them uses them to actively and consciously judge other people and groups. Implicit stereotypes are those that we unconsciously hold and use automatically, even if they contrast our conscious beliefs**.** Researchers identify it through the implicit association test. People are either shown words or photos and then they have to connect those to the concepts. People can classify two concepts together more quickly if they are already strongly associated in their minds.

FQ.18: What evidence suggests that implicit prejudice can cause police officers to shoot at black suspects more readily than at white suspects?

Experiments have shown that people are able to distinguish briefly shown images of dangerous and threatening objects faster if they are preceded by briefly shown images of black faces than white faces. This study yields results that confirm the effects of these stereotypes that contributed to the events of past years where black people have been shot because the objects they have been holding or reaching for have been confused with threatening objects by non-black police officers.

FQ.19: What sorts of learning experiences are most effective in reducing (a) explicit and (b) implicit prejudice?

It seems like people who want to consciously overcome their prejudices show a decline in their explicit stereotypes. Whereas people who engage in social interaction, exchange and show sympathy towards the members of the group they show prejudice towards have a great decline in their implicit stereotypes.

FQ.20: How does Zajonc's theory explain both social facilitation and social interference? What evidence supports the theory?

Zajonc argues that observation enhances our ability to complete a simple or well learned task and interferes our ability to complete a complex or new task. Experiments and observations conclude that between groups that execute the same tasks, experts are influenced positively by the presence of others whereas novices are influenced negatively. People are also affected negatively when their efforts are disapproved, and positively when their efforts are approved.

FQ.21: What evidence supports the view that choking on tests occurs because distracting thoughts

interfere with working memory?

According to the evaluation of Zajonc's studies, preoccupation about the task, its difficulty, thoughts of evaluation and failure take up the limited capacity of the working memory, leaving little or no place for the actual task to be executed.

FQ.22: How can the activation of a stereotype influence test performance? What evidence suggests that this effect, like other forms of choking, involves increased anxiety and interference with working memory?

Studies conducted suggest that high social pressure can interfere with the processing of hard, complex task which require working memory capacity to be completed, but it had insignificant or no effect on easy, simple and well-practiced tasks. The stereotype threat seems to undermine confidence and motivation, which increases anxiety. Anxiety and worrisome thoughts then take up too much space in working memory.

FQ.23: How do certain theatrical and political metaphors apply to impression management? Why do we, as intuitive politicians, want to look "good" to other people?

We often "play" in front of different "audiences" and we want to present our best selves, as in our aspects that best fulfil the needs of the specific setting we're in. Also we require support from others and we try to get it by presenting our goals and having approval and appraisal for our "best selves".

FQ.24: What are two classes of reasons why people tend to conform to examples set by others?

One of the reasons is information influence; if the majority conforms to a rule or norm, for the lack of a better standing point, it is best if we stick with the examples they set. The other is normative influence; a social group is bound together by certain norms they all conform to, and not doing so can result in disapproval or rejection.

FQ.25: How did Asch demonstrate that a tendency to conform can lead people to disclaim the evidence of their own eyes?

An experiment conducted by Asch revealed that even if the information people are presented with is crystal clear, conformity can still lead them to wrong and objectively absurd answers.

FQ.26: According to Cialdini, how can public-service messages best capitalize on normative influences? What evidence does he provide for this idea?

The behaviour on which public-service messages focus on tends to become the norm, since many people are depicted to follow this behaviour. Therefore Cialdini demonstrated the positive effects of depicting people who behave in the desired manner in one of the messages and gaining a striking result of a 25% increase in the desired behaviour.

FQ.27: How can the failure of multiple bystanders to help a person in need be explained in terms of informational and normative influences?

When nobody is attempting to help, the informational consensus of impracticality or impossibility to help forms, which prevents people from taking an action even more. Also, we unconsciously evaluate others' actions to decide on our own; if we take action when no one is taking, we might seem foolish or complacent.

FQ.28: What is the value, for group life, of the spread of sadness, anger, fear, and laughter from

person to person? How might motional contagion figure into the rise of a group leader?

A harmony of mental and emotional states helps establish a highly functional unit; sharing of various negative or hostile emotions can help relieve the negative feelings, resolve a problem or engage in the conflict; collectively protect themselves, detect threats or other factors or go into a playful state in which collective playfulness is key not to offend anyone or misinterpret any action.

FQ.29: What are some experiments that have demonstrated group polarization?

In a mock trial, judges that have not shared the same opinion came out to have even more radical stances on the matter after discussion.

FQ.30: How did Janis explain some White House policy blunders with his groupthink theory? What can groups do to reduce the risk of groupthink?

Janis indicated that some of the worst decisions made by White House were aimed at confirming the pre-existing views of the president, reach a consensus or keep the reputation positive. According to Janis, if the leader refrains from taking a stance and the members of the group focus on the problém instead of each other's points of view, groupthink can be overcome.

FQ.31: How can the low-ball sales technique be explained in terms of cognitive dissonance? What evidence supports this explanation?

According to Cialdini's work, when a person is convinced to make a purchase for a certain price, the news that the price is actually higher does not change their heart and they change their perception of the material; they render it more valuable not to clash with the amount of money they agreed to pay for the object.

FQ.32: How can the foot-in-the-door sales technique be explained in terms of cognitive dissonance?

When people agree to a small request, they are primed to accept larger requests without much questioning; since the person agreed to fulfill the salespersons' wishes, they use cognitive dissonance to induce a sense of compliance and trust towards the salesperson.

FQ.33: How did Milgram demonstrate that a remarkably high percentage of people would follow a series of orders to hurt another person?

Under the instructions of a stern researcher, the subjects feel the obligation to go on with the research even though the researcher was not angry or threatening whatsoever; he was just persistent.

FQ.34: Why does Milgram's finding call for an explanation in terms of the social situation rather than in terms of unique characteristics of the subjects?

Many replication studies conducted with people from different backgrounds, professions, age groups, sexes throughout years have indicated that similarities between the results are far greater than the differences. Since almost all of the variables regarding the subjects have been tried, the similarities must stem from the experiment's side.

FQ.35: How might the high rate of obedience in Milgram's experiments be explained in terms of (a) the norm of obedience, (b) the experimenter's acceptance of responsibility, (c) the proximity of the experimenter, (d) the lack of a model for rebellion, and (e) the incremental nature of the requests?

Subjects to this experiments come from a world where it is effective to obey to a superior in the field, in

this case, the Yale scientist. Since the responsibility of the experiment was on the scientists' shoulders, the subjects were encouraged to continue their function in the experiment by the scientists' calm and confident fashion. When the authoritative figure that is the scientist was further away and/or when the "learner" – in reality, a confederate of the researchers – was brought closer to the subject, the rates of obedience fell in varying degrees. When the subjects had a companion, again a confederate, they tended to mimic their behaviour; if they conducted the experiment until the end or if they refused to continue so did the real subjects. Cognitive dissonance also renders the subjects more inclined to continue the experiment, since they have administered weak electrical stimuli before, and the claim that these stimuli would be unethical would generally clash the idea they had no problem with administering slowly increasing stimuli before. (Foot-in-the-door technique)

FQ.36: How has Milgram's research been criticized on grounds of ethics and real-world validity, and how has the research been defended?

This experiment has been criticised over the mental state of excessive nervousness it drives the subjects, however Milgram reassured the scientific community that as much briefing as possible was given to the subjects prior to the study. Follow up research has concluded that most of the participants were glad to have participated and no psychological damage was found to have been caused. There were concerns about the practicality of the experiment as well, since it was a unique and highly unlikely condition. The defence to this allegations came from the indication that these subjects did not blindly follow the instructions as subordinates, but they might have unconsciously had doubts about the fabrication of the study, and fought against the prospects that they may or may not have actually hurt the learner.

FQ.37: How does "the tragedy of the commons" illustrate the critical importance of social dilemmas to human survival? What are some examples of real-world social dilemmas?

When everyone considers the prospect that everyone except them take the selfish route and individually profit, they tend to take the selfish route and be collectively damaged from it. Contribution to pollution (I do not individually contribute to it, everyone does it so I can keep driving my car) or teamwork (I'll just slack off so all others can do what I was supposed to do anyway) can be given as examples.

FQ.38: How have laboratory games demonstrated the human sense of justice and willingness to punish even at personal cost? How does such behaviour promote long-term cooperation?

When given equal resources and asked to contribute to a mutual greater cause, the people who contribute are often willing to give up their resources or prize to punish the ones who do not contribute. When introduced to the prospect of punishment, much less people refrain from contributing. If I help someone today, the person will remember it and maybe even tell others which gives me a higher chance that someone else will help later since I have a good reputation.

FQ.39: What is some evidence that social identity can lead to helping group-mates and hurting those who are not group-mates?

Studies conducted indicate that people feel pleasure – schadenfreude – when an individual from a rivalling group is faced with negativity. We also apparently tend to help those in our group more than others.

FQ.40: What changes occurred within and between two groups of boys as a result of intergroup competitions at a summer camp?

Children of the same group put aside their individual differences and focused on shared values of their

group and became more connected to it. They developed a negative view of the other group even though they were all very similar and assigned randomly to these groups, and hostility in between group interactions has quickly escalated.

FQ.41: How did Sherif and his colleagues succeed in promoting peace between the two groups of boys?

When two rivalling groups were assigned with superordinate tasks – those that required cooperation and served their mutual interests – the boundaries between the groups slowly faded and the boys started seeing themselves as a member of a higher and larger group that was comprised of the two tribes they have initially created. After such tasks, the children abandoned hostility and were peaceful on their own initiative.

Chapter 14

FQ.1: What is a trait, and how do traits differ from states? What does it mean to say that a trait is a dimension rather than an all-or-none characteristic?

Trait is a rather stable inclination to behave in a certain manner. State is the manifestation of the trait triggered by the environment, and not the inclination itself. Traits are found it various dimensions of severity rather than an absolute having or lack of it.

FQ.2: How is factor analysis used to identify trait dimensions that are not redundant with one another?

Factor analysis analyses patterns of correlations to be able to extract mathematically defined factors, which underlie and help make sense of those patterns. A factor-analytic study of personality includes the collection of data in form of sets of personality measures taken across a large sample, correlation of the various data sets to one another in order to come up with correlation coefficients and labelling of various dimensions consisting of the correlating data. The conclusion is that these dimensions because they define at least a part of a set of more specific terms.

FQ.3: Why is the five-factor model of personality generally preferred today over Cattell's trait theory?

It is argued that Cattell's 16-factor theory is overly complex and contains redundant factors. Moreover, studies regarding this subject have yielded results consistent with and supportive of the five-factor model.

FQ.4: What is grit, what does it predict, and how is it similar to or different from the personality trait of conscientiousness?

Grit is a higher-order personality trait that is independent of IQ and is predictive of success in a wide range of dominions. It accounts for additional individual differences that are beyond conscientiousness and IQ.

FQ.5: What are some of the costs and benefits for people with "dark personalities"?

Even though people with "dark personalities" are hard to get along with and not conscientious or

agreeable, they make better short-term partners, they can leave good impressions in rather brief encounters and are usually better at crisis management, agenda setting and more able to persuade public.

FQ.6: How do researchers assess the validity of personality tests? What are some sample findings that show that measures of the Big Five personality traits are, to at least some degree, valid?

Researchers assess validity of personality tests by comparing the test results of a person to their actual world behaviour. Big Five personality traits have been found to confirm some particular types of behaviour in the subjects' lives. For example, people that report to be more neurotic also pay more attention to and remember more threatening or unpleasant information, are likely to show distress when given an unexpected task, to have divorces and mental disorders. People who score high on extraversion attend to more social gatherings and are rated more popular, more often seen as leaders, live and work with more people, mimic the behaviour of others and are less disturbed by sudden intense stimuli. People with high scores on openness to experience are more likely to enroll in liberal arts programs, change more careers in adulthood, perform better in training for jobs, are more likely to play an instrument, are more tolerant to diverse world views and have less racial prejudice. People who score high on agreeableness are more willing to lend money, have fewer behaviour problems in childhood, manifest less alcoholism and arrests in adulthood, are more successful in the workplace, and are happier with their marriages. People who score high on conscientiousness are more sexually faithful to their partners, receive higher ratings for job performance and higher grades in school, put more effort into academic subjects that are uninteresting, smoke and drive less, drive more safely, follow healthier diets and live longer.

FQ.7: Why might personality traits be most apparent in novel situations of life transitions?

Due to a lack of social norms and cues to guide us as to how to behave, our traits might take over and exhibit themselves in a more excessive manner.

FQ.8: What is evidence that personality is relatively stable throughout adulthood?

Personality studies conducted with subjects as well as their relative have found rather large correlation coefficients between the answers of subjects if they were adults both of the times they have answered the questions.

FQ.9: How have researchers assessed the heritability of personality traits? What are the general results of such studies?

Researchers have compared tests results from identical twins and fraternal twins and found a greater correlation between the results of the identical twins than the fraternal twins – roughly .50.

FQ.10: What evidence suggests that being raised in the same family does not promote similarity in personality?

Studies conducted with identical twins that were raised in completely different households yielded results that confirm the previous studies – the correlation was almost as large as it was for identical twins that were raised in the same home.

FQ.11: How might variations in single genes influence personality?

Studies have shown that a difference in alleles affecting neuroticism causes a great variance in behaviour by affecting the serotonin secretion. The trait of novelty seeking also has variations related to alleles that cause variation in dopamine.

FQ.12: How does a distal explanation of personality differ from a proximate one?

A proximate explanation would focus on ways by which differing genes and experiences work to make us different, whereas a distal explanation would focus on its evolutionary functions, such as the ways it might help us in producing different offspring to increase their chances of survival.

FQ.13: How does an analogy to financial investment explain the value of producing offspring who differ from one another in personality?

Diverting the resources in hand to instruments with different qualities that respond differently to different conditions decreases the chance of greater losses, and makes it viable that even if a portion of the investment fails the others can prosper.

FQ.14: How might both heritable and nonheritable variations in the Big Five dimensions be explained in terms of alternative life strategies?

Different variations of the Big Five as well as both of all their extreme ends can come in handy in varying conditions that require varying behaviour and strategies to survive and reproduce.

FQ.15: What is meant by orchid and dandelion children, and how do they relate to the idea of differential susceptibility to environmental influences?

Orchid children are more susceptible to environmental influences, therefore need more care and support to flourish, whereas dandelion children are less sensitive to their environment, and therefore can thrive in most conditions.

FQ.16: How might sibling contrast and split-parent identification be useful in reducing sibling rivalry and diversifying parental investment?

When siblings are viewed with their different qualities, needs and overall personalities, both the parents and the children reduce the chance of a sibling rivalry and instead enable that the siblings are cared for and rewarded separately.

FQ.17: What differences have researchers found between women and men in personality traits?

Women are more agreeable, neurotic, conscientious, warm, gregarious and concerned with maintaining positive social relationships than men. They also score higher on aesthetics facet of openness to experience but not the other four.

FQ.18: How might gender differences in personality be understood in terms of natural selection? What evidence suggests that hormones may provide a basis for such differences?

Through time females have faced more challenges than males regarding the nurturing of their offspring which might have developed the internal structures that promote cooperation and nurturance and

caution, whereas males have faced more challenges than females regarding competition, violence and protecting their family, which might be the cause of underlying mechanisms in males that promote these behaviour. These behaviours are also consistent with the prominent hormones in each sex and their corresponding effects.

FQ.19: What evidence supports the view that gender differences in personality are at least partly shaped by cultural expectations?

Personality tests conducted in a span of 60 years in the USA concluded that women were able to be self-sufficient and assertive when cultural conditions required them so, and were less assertive when there was no need or inducer. Also, in cultures where people are relatively more able to shape their roles in society, the difference was greater and the roles of women were characterised by their femininity brought by females occupying these roles.

FQ.20: What characteristics of the mind underlie personality differences, according to the psychodynamic perspective?

People are often unconscious of their motives and defence mechanisms keep these anxiety-producing motives and thoughts out of conscious mind. Personality differences lie in variations of unconscious motives, their manifestations and people's defence from anxiety.

FQ.21: How is the concept of unconscious motivation illustrated by posthypnotic suggestion?

Unconscious motivations are unconscious, unintentional impulses that produce a certain behaviour, which we cannot consciously explain the causes for and make up alternative, seemingly plausible but false explanations instead, just like when the patient doesn't remember the commands of the doctor but performs them anyway and tries to come up with an explanation.

FQ.22: How did Freud draw inferences about the content of his clients' unconscious minds?

Freud believed that drives, like pushed springs, were piling up energy under suppression and had to be somehow released. Since the most suppressed intuitions of human were sexuality and aggressiveness in the time when Freud lived, he identified these two forces increasingly broadly, as the source of pleasure, life and destruction.

FQ.23: How do repression, displacement, reaction formation projection and rationalization each serve to defend against anxiety?

Repression is the suppression of anxiety provoking memories and separating them from conscious memory. Displacement is the reflection of an unconventional drive on a rather practical action that is symbolically equivalent to the primal drive. Reaction formation is the tendency to vigorously separate oneself from a concept by embracing the polar opposite of what the concept entails. Projection is the sensation that it is not oneself but someone else that is having a strong feeling or drive, when it is actually the person, not someone else. Rationalisation is trying to bring a conscious and logical explanation to one's drives that provokes anxiety and is not easy to face to its full extent.

FQ.24: What evidence exists that some people regularly repress anxious feelings? In general, how do such people differ from others in their reactions to stressful situations?

Even though repressors claim that they are not anxious, their answers to the standardised test questions are usually defensive, and these people need to see themselves as favourable. They also show more bodily signs of distress when confronted with rather disturbing concepts, but insist that they are not anxious, and this is not wrong; these people have banished anxiety from their conscious minds but are unable to suppress its bodily symptoms.

FQ.25: What benefit and harm might accrue from the repressive style of coping?

Apparently repressive coping can enable people to overcome great traumas in their lives, maintain a positive outlook on life and be functional –by leaving space in the working memory to allow problém solving mechanisms and conscious mind to lead the way. On the other hand, the emotional distress caused by the suppressed emotions, thoughts and drives can manifest themselves as chronic bodily pain and health problems.

FQ.26: What relationships did Vaillant find between defensive styles and measures of life satisfaction?

When defensive styles were more mature, the quality and overall satisfaction increased. Conversely, people who adapted more immature defensive styles were mostly not satisfied with various aspects of their lives. The ratio of mature to immature defensive styles has shown a correlation with age as well.

FQ.27: How, in general, do humanistic theories differ from psychodynamic theories?

Humanistic theories concern a conscious understanding of oneself and their capacity to fulfil their desires whereas psychodynamic theories concern unconscious motivations and defences.

FQ.28: What is Maslow's theory about the relationship among various human needs? How might the theory be reconciled with an evolutionary perspective?

Maslow identified five steps of needs in a hierarchical order, in which the needs have to be met to be able to continue with the next one. From an evolutionary perspective, this hierarchy makes sense, as one needs to direct their energy to more primal needs to be able to focus on the next steps, whether by acquiring new skills and connections to ensure the next steps or by staying alive.

FQ.29: How, in general, do social-cognitive theories differ from psychodynamic theories?

Psychodynamic theories focus on the instinctive, unconscious motives as the primal factors that shape personality, whereas social-cognitive theories emphasize one's general beliefs of the world around them, acquired through experience.

FQ.30: What sort of behaviours correlate with an internal locus of control?

People with an internal locus of control have found to actively take precautions and measures to accomplish their goals or prevent dangers, they were able to decide more independently and confidently, they chose games of skill over games of chance, and they were more likely to implement high-risk and innovative strategies for their businesses.

FQ.31: What evidence supports the theory that self-efficacy (a) predicts high performance and (b) may help cause high performance?

Studies conducted by Bandura and his colleagues have shown that increased self-efficacy, both by legitimate treatments or false claims, will provide a sense of strength and competence, and will actually help the individuals overcome the tasks they have been assigned.

FQ.32: What is the benefit of the belief that the self is malleable? How can people's belief in their own malleability be enhanced, and what effects have been observed of such enhancement?

People that view themselves as malleable tend to strive more for success, rebound easier from setback, improve as people and embrace education and change. When people are shown that the human brain keeps growing and evolving throughout life, they became more malleable and had more enthusiasm for their work as well as higher success.

FQ.33: What evidence supports the value of optimism? Through what mechanisms might optimism produce its beneficial effects?

People with an optimistic style of thought are happier and tend to overcome hardships more and more easily than people with pessimistic lifestyles. Optimistic people were quicker to recover from various conditions, which might be explained by their tendency to direct energy and focus to solving their problems.

FQ.34: What seems to differentiate adaptive from maladaptive optimism and adaptive from maladaptive pessimism?

Adaptive optimism push people to do what they need to do along with the belief that their work will pay off, leading to success; maladaptive optimists expect fate to take care of their issues and often fail. Adaptive pessimists use their sense of inadequacy along with prospects of failure to push them to work, which finally pays off; maladaptive pessimists don't believe they can achieve their goal and don't even bother trying, therefore inevitably fail.

FQ.35: What evidence supports Mischel's concept of situation-specific dispositions?

Mischel argued that the traits people are identified with are often thought of out of context, and studies have shown that the context a person is in can alter their behaviour a lot. Moreover, behaviours concerning the same trait have shown inconsistencies among different contexts.

FQ.36: In general, how do personalities in collectivist cultures differ from those in individualist cultures? What problems might arise in people whose personalities conflict with the norms of the culture in which they live?

People living in collectivist cultures tend to emphasise more on interdependence and societal roles whereas members of individualist cultures focus more on personal interests and abilities rather than the interest of the group. When people have personalities conflicting the demands of their society, they might have adjustment and acceptance problems.

FQ.37: What sorts of trait dimensions are emphasized in China more than in Western cultures?

In China, focus was more on interpersonal relationships and interdependence, as well as inner peace, harmony and integrity.

Chapter 15

FQ.1: How is psychological disorder defined by American Psychiatric Association? What ambiguities lie in that definition?

According to APA, a psychological disorder is a syndrome characterised by clinically significant disturbance in an individual's cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. This definition fails to specify how much distress or dysfunction is considered "clinically significant". Moreover, the causes of the perceived impairments cannot be confidently diverted between the individual and the environment. It is also impossible to decide who will assessed and how will psychological disorders be assessed.

FQ.2: How does validity differ from reliability? How can the validity of the DSM be improved through further research and revisions?

If a diagnostic system can successfully identify and categorise a group of people seemingly suffering from a condition without any usefulness in the diagnosis, this system can be highly reliable without being valid. DSM can be revised and improved by extending studies both to the roots and development of the disorders and to the possible treatments and patients' reactions to them.

FQ.3: What are some negative consequences of labelling a person as psychologically disordered? What is recommended as a partial solution to this problem?

The labelled person can lose the needed esteem from their environment and even themselves; and clinicians may be blinded to the person's other qualities that are not within the label they've been given. A partial solution has been proposed by APA in 2013, indicating that these people should be referred to has persons with a condition, not the pronoun or adjectives these diagnoses entail; for example, "a person who suffers from alcoholism", not "an alcoholic".

FQ.4: How does the example of homosexuality illustrate the role of culture in determining what is or is not a "disorder"?

Homosexuality was removed from DSM when it was understood that the suffering of gays and lesbians did not stem from homosexuality itself but from the rejection and prejudice the society had for them. The view of culture on a condition – or in case, not a condition – can be of great importance in determining how it should be treated.

FQ.5: How is ADHD identified and treated? How do critics of the high rate of diagnosis of ADHD explain

the high rates?

ADHD is identified by problems with schoolwork stemming from either a hardship of following and completing instructions, or instability and hyperactivity, or sometimes both. The most common treatment for ADHD is methylphenidate, which increases the activity of dopamine and norepinephrine in the brain. Many critics argue that the schools have substantially increased their standards of obedience and success, therefore many behaviours have a lower threshold of classification as a disorder now.

FQ.6: How are Down syndrome and Alzheimer's disease characterised as brain diseases?

In Down syndrome, the extra chromosome retained in all bodily cells of the individual disrupt normal brain development and cause intellectual and motor disabilities. Alzheimer's disease is prevalent in older adults, and is mainly caused by the abundance of amyloid plaques that fill the gaps in between neurons, impairing neural transmission and ultimately causing impairments related to memory, reasoning, spatial perception, language and bodily functions.

FQ.7: How can the causes of psychological disorders be categorised into three types – "the three Ps"?

These causes can be identified as predisposing, precipitating and perpetuating causes.

FQ.8: What are four possible ways of explaining sex differences in the prevalence of specific psychological disorders?

Reasons could be the difference in suppressing or reporting psychological distress, clinicians' expectations

about finding a disorder in a specific gender, differences in the stressful experiences faced between the genders, and these genders' predispositions of coping with these stressors.

FQ.9: How can generalized anxiety disorder be understood in terms of hypervigilance, genes, early traumatic experiences, and cultural conditions?

A heightened predisposition to determine potential threats – hypervigilance – can be both a predisposing cause of the disorder and a symptom. It can be caused by genetic influences on brain development, as a failure of the suppression of amygdala. Unpredictable childhood and early traumas can also predispose an individual to be highly alert and adaptive in terms of fear at all times. In the new modern world where all societal norms and expectations change constantly, it is hard to live a completely predictable life.

FQ.10: What evidence links phobias to the kinds of fears that most people have?

Phobias are often excessive and irrational fears related to objects or concepts that most people fear, and

phobias are more prevalent in women; a reason for this could be that men – or boys – are expected to be more courageous and not exhibit their fears.

FQ.11: How might phobias be 1. It can be caused by genetic influences on brain development, as a failure of the suppression of amygdala. Unpredictable childhood and early traumas can also predispose an individual to be highly alert and adaptive in terms of fear at all times. In the new modern world where all societal norms and expectations change constantly, it is hard to live a completely predictable life.

explained in terms of learning that has been prepared by evolution?

Some cases of phobia are directly related to traumatic experiences, which might have conditioned the person to have an excessive fear of the subject over only one pairing with the trauma.

FQ.12: Are phobias such as fear of snakes "innate"? Can an evolutionary perspective help us explain some phobias?

Some propose that some subjects could be more likely to have a phobia developed for if they are/were

significant and/or threatening over the course of our evolution, and this proposition would explain why

snakes and spiders are easier to be afraid of than cars. Subsequent study has shown that infants are born

with a readiness of acquiring fear of some subjects more easily than others.

FQ.13: What learned pattern of thought might be a perpetuating cause of panic disorder?

People suffering from panic disorder are inclined to interpret various stimuli of physical arousal as signs

of a panic attack, and in turn have an increase in these aspects of physical arousal because of their

worry. Therefore, the physical arousal becomes both a perpetrator and a symptom of the condition.

FQ.14: How are obsessive-compulsive disorders similar to phobias? How do they differ? What kinds of

obsessions and compulsions are most common?

OCD and phobias are both known to be irrational to the person, but OCD is directed to non-existent and

can only be overcome by performing a specific action or task. The most common obsessions are

diseases, death and disfigurement, and the most common compulsions are checking and cleaning.

FQ.15: How might damage to certain areas of the brain result in obsessive-compulsive disorder?

Damage to some portions of frontal lobes of the cortex and parts of the underlying limbi system and

basal ganglia can interfere with the circuit that controls voluntary actions and can suppress the sense of

safety and closure usually occurring following the completion of a task.

FQ.16: How does posttraumatic stress disorder differ from other anxiety disorders?

PTSD is necessarily brought on by a traumatic experience the person has been through.

FQ.17: What conditions are particularly conducive to development of posttraumatic stress disorder?

Repeated exposure to traumatic events, objects and sights correlates more with cases of PTSD than a

single trauma does.

FQ.18: Why might some people be more susceptible to PTSD than other people?

High control over executive functions, especially emotional regulation, correlates with less susceptibility

to PTSD.

FQ.19: What are some similarities and differences between depression and generalized anxiety?

They are both predisposed by the same genes and they can occur at the same time or one by one. The

main difference could be understood by the roles they have on the life's progress: anxiety is a frantic

attempt to cover from the hardships and depression is the state of despair after seemingly giving up.

FQ.20: According to the hopelessness theory, what pattern of thinking predisposes a person for depression? What is some evidence for that theory?

According to the theory, thoughts of disastrous consequences following a failure, finding inadequacies within oneself to explain the failure and generalisation of the found negative trait to all times and contexts can predispose someone for depression. [No evidence (?)]

FQ.21: How might rumination serve to enhance or worsen depression?

Rumination causes fixation on problems and negative thoughts, interfering with problem-solving processes.

FQ.22: How did Kendler demonstrate that the onset of major depression typically requires both genetic predisposition and a severely stressful life event?

The experiment he conducted with twins showed that there was a high correlation between the genetic

predisposition and stressful events in causing depression.

FQ.23: What early evidence supported the theory that depression results from a deficit in the neurotransmitters norepinephrine and serotonin? Why is that theory now doubted?

The contents of anti-depressants indicated that malfunction of these neurotransmitters must be the cause of depression. However, this theory has since been doubted since it doesn't explain the delayed effects of antidepressants, even though they enhance the activity of these neurotransmitters right away;

and depressed people do not seem to have a lower level of these substances compared to non-depressed people.

FQ.24: According to a new theory, how might stressful experiences alter the brain in a way that brings on depression?

In continuous stressful situations, cortisol secretion in the brain can cause some portions of the brain to

shrink. This is reversible, and a continuous stimulation of the brain by norepinephrine and serotonin can

result in growth of brain areas, which can explain the delayed effects of antidepressants.

FQ.25: How might moderate depression, following a loss, be adaptive?

It might indicate our non-threatening state, make us have a more realistic view of the world, and lead us

to clear our heads to renew our approach to life.

FQ.26: According to Keller and Nesse, how might depressed moods vary, adaptively, depending on the situation?

In general, episodes of depression signal our need for help, promote useful behaviour and situations, and

weed out useless behaviour that might interfere with a realistic approach to our life.

FQ.27: How are manic states experienced? What is some evidence linking mild manic (hypomanic) episodes to heightened creativity?

Manic states are usually characterised by increased self-esteem and talkativeness, euphoric feelings, decrease in need for sleep, enhanced energy and enthusiasm and creativity. The high energy and confidence can contribute to creativity in the beginning, but after some point it becomes maladaptive and creates a false belief of security and ability.

FQ.28: What's the evidence that creativity is related to hypomania?

Studies biographies of eminently creative people have revealed that they disproportionately suffered from bipolar disorders. They also provided most of their best work during hypomanic episodes. People that were not famous for being creative also showed that their most creative times were times of hypomanic episodes and studies with people without these disorders have indicated that there was a correlation between enhanced creativity and openness to experience and inclination to bipolar disorder.

FQ.29: What are the five main classes of symptoms of schizophrenia?

They are disorganised thought and speech, delusions, hallucinations, grossly disorganised or catatonic behaviour and negative symptoms.

FQ.30: What early evidence supported the dopamine theory of schizophrenia? Why is the simple form

of that doubted today?

Studies indicating that drugs involved in dopamine blockage could also decrease symptoms of schizophrenia and that drugs that increase dopamine levels also promote similar behaviour to schizophrenia was seen as a large evidence towards this theory, but it is now doubted since it fails to provide an explanation for symptoms that are unrelated to dopamine secretion.

FQ.31: What evidence supports the theory that a defect in glutamate neurotransmission may play a role in schizophrenia?

The fact that the drug called PCP can induce symptoms associated with schizophrenia by blocking glutamate neurotransmission is indicated as a possible evidence.

FQ.32: How might an exaggeration of a normal developmental change at adolescence help bring on schizophrenia?

Problems with neural pruning during childhood and adolescence can cause to an excessive loss of gray matter which might be an underlying mechanism of schizophrenia, since many people who suffer from schizophrenia have been found to have larger declines in gray matter.

FQ.33: How do the varying rates of concordance for schizophrenia among different classes of relatives support the idea that heredity influences one's susceptibility for the disorder?

Concordance increases as a biological relative is closer to the index case, and this variation is not observed in adopted children, which indicates a direct effect of heredity in exhibition of schizophrenia.

FQ.34: What sorts of early disruptions to brain development have been implicated as predisposing causes of schizophrenia?

Prenatal malnutrition, prenatal viral infections, oxygen deprivation during and trauma to the brain during

birth as well as brain damage sustained until 10 years of age can increase the chances that the individual

will develop schizophrenia.

FQ.35: What evidence suggests that the family environment may promote schizophrenia, but only in those who are genetically predisposed for the disorder?

Long studies have shown that family environment and their fashion of communication can be highly influential for adopted children that are predisposed to developing schizophrenia, but not on low-risk children, which indicates the effect of family environment on genetically predisposed children.

FQ.36: What cross-cultural difference has been observed in rate of recovery from schizophrenia? What are some possible explanations of that difference?

Many people from all across the world were able to recover from schizophrenia, but rate of recovery was greater in developing countries than those of developed countries. One explanation might be the interdependent nature of developing nations that comfort and reassure the individuals, helping their recovery. They are also more likely to view the disorder as a temporary condition and aren't affected by the social stigma schizophrenia carries. This lack of stigmatisation also helps the individual to keep being included in the society as a functioning member. A lack of drugs during the treatment has been also correlated with high recovery rates.

FQ.37: What is a personality disorder, and how is it similar to and different form related, more serious disorders?

A personality disorder is an enduring pattern of behaviour, thoughts, and emotions that impair a person's sense of self, goals, and capacity for empathy and/or intimacy. Even though personality disorders' defining traits can be similar to some extreme behaviour that is still considered "normal", they are identified by some extreme traits that are consistent.

FQ.38: Describe the three clusters of personality disorders. Within each cluster, how easy do you think it is to differentiate the symptoms of one disorder from those of others?

Cluster A is "odd", Cluster B is "dramatic" and Cluster C is "anxious". Even though the disorders within these clusters are different from one another in terms of most internal qualities, their qualities that are observable right away are much more similar than it is ideal to distinguish.

Chapter 16

FQ.1: How has Western society's response to people with serious psychological disorders changed over the centuries? What were the goals of the deinstitutionalization movement?

Until recently, Western societies have viewed people with disorders as inherently evil and they did everything in their power to alienate them from society, including killing them and cramming them inside mental institutions. Deinstitutionalisation movement aimed to use the benefits of medical drugs in controlling behaviour of these people and actively include these people into the society.

FQ.2: How do assertive community treatment programs attempt to help the severely mentally disordered and their families?

With the help of a team consisting of adequate professionals of varying fields, people with mental illnesses and their families are visited regularly and offered counselling. These people are ready for crisis interventions whenever it may be necessary.

FQ.3: What are the major categories of mental health providers?

Mental health providers consist psychiatrists, clinical psychologists, counselling psychologists, mental health counsellors, psychiatric social workers and psychiatric nurses.

FQ.4: According to a survey conducted in the United States, where do people with psychological disorders typically find treatment, and what types of treatment do they find?

%22 of them had received treatment from a mental health professional, %59 of them had received no treatment whatsoever, and most of the rest of them had received treatment from a medical doctor or nurse who did not specialise in mental health.

FQ.5: What is known about the mechanisms, effectiveness, and limitations of drugs used to treat schizophrenia, generalized anxiety and depression?

These drugs work mainly by blocking dopamine activity, and some new generation versions affect receptors for other neurotransmitters as well. They all have side effects; research on atypical (new generation) drugs conducted by pharmaceutical companies have indicated that they were more effective and led to less side effects, but recent large scale unbiased studies have questioned these claims. Medicine for schizophrenia can have severe side effects, so many patients stop taking the medicine

before it is instructed so. There are claims about whether if these patients would be better off without medicine in the first place, but there have been no studies about this topic. Tranquilizers, used for anxiety, function by augmenting the action of neurotransmitter GABA, which is responsible for inhibition.

Therefore, increase in GABA decreases neural excitability. Even though tranquilizers in general were seen as highly effective, recent studies have refuted these claims. Moreover, they have serious side effects during use and withdrawal. They are also addictive in varying degrees and increase the effect of alcohol.

Both types of drugs (tricyclics and SSRIs) for depression seem to be somewhat effective, compared to placebo and control groups, but the effectiveness decrease as the severity of depression increases. They have considerable side effects, but doctors still advise the continued usage of them to maintain the positive effects of the drug.

FQ.6: What are three different reasons why symptoms of a disorder may decline after being treated with a drug?

Spontaneous remission effect is improvement without any treatment, placebo effect is any improvement shown by the placebo group that has surpassed the spontaneous remission effect, and drug effect is the improvement shown by the recipients of actual active substances that is beyond the improvement shown by those in the placebo group.

FQ.7: What evidence suggests that only a small percentage of the improvement following drug treatment for depression results from the chemical effects of the drug? Why might the power of suggestion, or expectancy, be especially effective in the treatment of depression?

Studies concluded that overall, half of the improvement shown can be attributed to placebo effect. A reason might be that the sensation of being treated and cared for can help restore a sense of importance and control, which might in turn promote prosocial and creative behaviour that might contribute to the

effect of placebo and improve one's condition.

FQ.8: Under what conditions and how is ECT used to treat depression?

If the depression is so severe that it doesn't respond to any other treatment, ECT can be used. It has a rather high success rate, and the patient is put under to prevent pain and involuntary muscle movement.

FQ.9: How are modern, refined forms of psychosurgery sometimes used today in the treatment of obsessive-compulsive disorder?

By destroying very specific parts of the brain involved in OCD, around half of the patients can be relieved of their incapacitating disorder; however, usually at the cost of new side effects that sometimes can be quite serious.

FQ.10: What is the advantage of deep brain stimulation over current forms of psychosurgery?

By implanting tiny electrodes into the brain, small currencies can be activated to stimulate neurons that produce the same effects as a lesion does but can be reversed by simply turning off the current and does not have the side effects.

FQ.11: According to psychodynamic therapists, what are the underlying sources of psychological disorders?

Psychodynamic therapists argue that unconscious thoughts, beliefs and memories are the underlying sources of psychological disorders.

FQ.12: According to psychodynamic therapists, what is the relationship between symptoms and disorders?

Symptoms are just observable outcomes of the disorder and these symptoms can be similar in cases with very different underlying disorders. The disorder needs to be surfaced to overcome the symptoms and treat the disorder.

FQ.13: How do psychodynamic therapists use patients' free associations, dreams, and "mistakes" as

routes to learn about their unconscious minds?

Psychodynamic therapists believe that when the patient relaxes, empties their mind and starts free association starting by a point provided by the therapist, they can infer unconscious elements from what they are saying. Dreams are seen as a pure form of free associations, since logic is usually absent and unconscious mind is set free. By seeing through the disguises in the dream, therapists can infer meaning from dreams as well. Slips and mistakes made during speech are also interpreted as surfacing of unconscious themes.

FQ.14: In psychodynamic therapy, how do resistance and transference contribute to the therapeutic process?

Increased resistance indicates the following of a correct direction, since unconscious defence mechanisms are activated. Transference, the direction of an unconscious emotion towards the therapist, can also make the individual aware of their emotions and possibly their source.

FQ.15: According to psychodynamic theories, how do insights into the patient's unconscious conflicts bring about a cure?

True insights accompanied by an intellectual and emotional acceptance of the unconscious material can free the patient of their defence mechanisms and consumption of psychic energy that was directed towards this issue. Once this has happened, the patient can consciously and effectively work on a cure.

FQ.16: What is the primary goal of humanistic therapy? How does that goal relate to existentialist philosophy?

Humanistic therapy aims to help people regain awareness of their desires and control of their lives. It is about the client leading the therapeutic process and finding insight within themselves.

FQ.17: How do the therapist's nondirective approach, empathic listening, and genuine positive regard contribute to the client's recovery, according to humanistic therapist?

During this type of therapy, the therapist lets client lead the way, doesn't present unsolicited

inferences,

listens patiently, encourages the client to talk when necessary and makes it clear that they're listening.

The client can be reflective of their own thoughts and expressions by the therapist's empathetic

listening, and the client can freely express themselves in the positive, non-judgmental environment the

therapist has created.

FQ.18: How has contingency management been used to improve children's behaviour and motivate

abstinence in drug abusers?

By changing the action and reward patterns into desired ones, behaviour patterns of children and drug

abusers can be changed so they know positive behaviour will be rewarded.

FQ.19: What is the theoretical rationale for treating specific phobias by exposing clients to the eared

objects or situations?

By exposing the client to the feared object or concept without any harm, the fear can be eradicated

through habituation or extinction, since the conditioned stimulus is presented repeatedly without the

unconditioned stimulus.

FQ.20: What are three ways of exposing clients to feared objects or situations, and what are the

advantages of each?

One way is imaginal exposure, and it can be generalised so that the patients will overcome the fear in

many different contexts with high effectiveness. The second technique is in vivo exposure, and even

though it's more impractical than imaginal exposure it has proven even more effective. The last option is

the rather recent virtual reality exposure, which is reasonably effective, more realistic and less costly.

FQ.21: How did virtual exposure treatment help Miss Muffet overcome her fear of spiders?

By exposing her to much extreme encounters with spiders, the therapists were able to make her

subconscious understand that none of the encounters she would have with spiders in real life would be

that scary, which allowed her to interact with spiders and overcome her crippling phobia.

FQ.22: How is behaviour therapy distinguished from cognitive therapy?

While behaviour therapy deals with troubling behaviour, cognitive therapy deals directly with the maladaptive patterns of thought that underlie these symptoms.

FQ.23: According to cognitive therapists, what is the source of clients' behavioural and emotional problems?

For cognitive therapists, people disturb themselves with their own maladaptive thoughts and beliefs that implement the feeling that world is a bad place and life is not worth living, which can be replaced with more adaptive ways of thinking to promote positive behaviour.

FQ.24: How did Ellis explain people's negative emotions in terms of their irrational beliefs?

Ellis labelled repetitive maladaptive behaviours and explained his clients' negative emotions by implementing his ABC theory of emotions, which explains the maladaptive behaviour or thought (B) between the activating event (A) and the emotional consequence (C).

FQ.25: What is the purpose of homework in cognitive therapy?

By having the patients consciously review, evaluate and find alternatives for their unconscious responses to events, therapists can replace these unconscious maladaptive processes with adaptive ones.

FQ.26: In what sense is a cognitive therapist initially a teacher and later a consultant?

First, the therapists directs the thoughts and progress of the patient and assigns them homework or various tasks. When the patient is able to direct the therapy in the correct direction, the therapist acts like a consultant to help them with advice when needed.

FQ.27: How does Beck's treatment of a depressed woman illustrate his approach to identifying and correcting maladaptive, automatic thoughts?

By pointing out and correcting her maladaptive thoughts and instructing her to do so, Beck enabled the depressed woman to catch, evaluate and correct her own maladaptive thoughts and emotions, pulling her out of depression. This pattern fits the description of transition between a teacher and a consultant.

FQ.28: Why must we rely on experiments rather than case studies to assess the effectiveness of psychotherapy?

Case studies give us particular and subjective results regarding the effectiveness of therapy, which might be attributable to many other elements of the patient's life or the point in life which they're in. Experiments give us a clearer view of these questions since they tend to include people in and from varying conditions.

FQ.29: How did an experiment in Philadelphia demonstrate the effectiveness of behaviour therapy and psychodynamic therapy?

By having three groups, of which two received the two different kinds of therapy and one did not receive any therapy, all of them improved at the end of 4 months with therapy groups exceeding the control group and having more or less the same improvement rate.

FQ.30: What is the evidence that psychotherapy works and that for some disorders it works as well as, or better than, standard drug treatments?

Studies and experiments have shown that therapy usually proves more effective than no therapy (naturally) and drug therapy. Even though these results can be subject to some conditions that improved the results, the disparity is still clear.

FQ.31: What general conclusions have been drawn from research comparing different forms of psychotherapy?

Even though different kinds of therapy seem to be effective for different kinds of problems, overall, they are more or less equally effective, since they seem to share many overlapping techniques and are not as different in practice as they are in theory.

FQ.32: How are support, hope, and motivation provided within the framework of standard types of psychotherapy? What evidence suggests that these common factors contribute to the therapy's effectiveness?

A relationship between the client and the therapist that is built on mutual trust and support is essential to the course of therapy, since many clients long for a safe environment in which they can express themselves without facing prejudice or judgment. Also, when the patient – and the therapist – has faith in and trusts the therapeutic process, it is likely to be effective even though the source of the hope and faith is wrong. Moreover, when the therapeutic process becomes a cooperation of the client and the therapist towards a plan and its execution rather than the therapist dragging the client towards a certain point, the process becomes much more effective and allow the client to actively reflect their past, present and future.