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| **Biological Rhythms: Infradian and Ultradian Rhythms** | | | |
| **Infradian and Ultradian Rhythms AO1** | | | |
| **Infradian Rhythms** | | | |
| **The Menstrual Cycle**   * Monthly changes in hormone levels regulate ovulation * The cycle is between the first day a woman’s period to the day before her next period * The typical cycle takes approximately 28 days to complete (though anywhere between 24-35 is generally considered normal) * During each cycle, rising levels of oestrogen cause the ovary to develop an egg and release it (ovulation) * After ovulation, progesterone helps the womb lining to grow thicker, readying the body for pregnancy * If pregnancy does not occur, the egg is absorbed into the body and the womb lining comes away, leaving the body (menstrual flow) | | | |
| **Research Study**   * The menstrual cycle is an endogenous system, but research suggests that it may be influenced by exogenous factors e.g. the cycles of other women * Stern and McClintock (1998) took 29 women with irregular periods, and gathered pheromones from 9 of the women at different stages of their menstrual cycles via a cotton wool pad placed in their armpit (these were worn for a minimum 8 hrs). * The pads were then rubbed onto the upper lip of the PPs systematically (day one of the research they were given a pad from day one the menstrual cycle, day 2 = second day of the cycle etc). * They found that 68% of the women experienced changes to their cycle which brought them closer to the cycle of their ‘odour donor’ | | | |
| **Seasonal Affective Disorder (SAD)**   * Main symptoms; persistent low mood, general lack of activity and interest in life * Often referred to as the *winter blues* as it symptoms tend to be triggered during winter months when there is less daylight due to shorter days * This is a *circannual* rhythm as it is subject to a yearly cycle – however it can be classed as a circadian rhythm as the SAD may be due to disruption of the sleep/wake cycle due to prolonged periods of daily darkness during winter * Melatonin is implicated in the cause of SAD * During the night, the pineal gland secretes melatonin until dawn when there is an increase in light * During winter, the lack of light in the morning means this secretion process continues for longer * This has a knock-on effect on the production of serotonin in the brain – a chemical that is linked to the onset of depressive symptoms | | | |
| **Ultradian Rhythms** | | | |
| The Sleep Cycle:   * Stages 1 and 2 – light sleep, person can be easily woken. Brainwave patterns tend to be slower and more rhythmic (*alpha waves*), becoming even slower as sleep becomes deeper (*theta waves*) * Stages 3 and 4 – involve *delta* waves which are even slower and have a greater amplitude than earlier wave patterns. This is deep sleep or ***slow wave sleep*** and it is difficult to rouse someone at this point | | | |
| **Infradian and Ultradian Rhythms AO3** | | | |
| **Evolutionary Basis of the Menstrual Cycle**  P: One strength of the theory of infradian rhythms is that there are supportive evolutionary explanations.  E: For example, there is a suggestion that menstrual synchrony was advantageous to our ancestors because if females menstruated together, then got pregnant together, the babies would be had at a similar time and so could be cared for collectively, increasing the offspring’s chances of survival.  E: This is a strength because it supports the claims made by Stern and McClintock’s research that it *is* possible to sync menstrual cycles in women, and therefore this infradian rhythm can be influenced by exogenous factors.  L: As a result, the theory of infradian rhythms and the control of these by both endogenous and exogenous factors is increased. | **Methodological Limitations in Synchronisation Studies**  P: One weakness of early synchronisation studies is that there may be confounding variable involved in the research which have not been considered.  E: For example, they argue that there are many factors that may influence a woman’s menstrual cycle such as stress, changes in diet, exercise etc.  E: This is an issue because any supposed pattern of synchronisation seen in the studies is no more than would have been expected to occur by chance. There is no guarantee, for example, that the pheromones had a direct impact on the menstrual cycle of the second woman.  L: As a result the research into infradian rhythms lacks validity, which reduces the credibility of the theory overall. | **Supportive Evidence for Distinct Stages in Sleep**  P: One strength of the theory of ultradian rhythms is that there is supportive research.  E: For example, Dement and Kleitman (1957) monitored sleep patterns of 9 adults in a sleep lab. Brainwaves were taken by EEG and researchers controlled for alcohol and caffeine. REM was highly correlated with the experience of dreaming, brain activity varied according to how vivid dreams were, and PPs woken during dreaming reported very accurate recall of their dreams.  E: This is a strength because this study suggests that REM (dream) sleep is an important component of the ultradian sleep cycle.  L: As a result, this increases the credibility of the theory of ultradian rhythms. | **Animal Studies**  P: One weakness of research into biological rhythms such as ultradian and infradian is that much of the research is conducted on animals.  E: For example, the role of pheromones in animal sexual selection is well documented e.g. sea urchins release pheromones into the surrounding water so other sea urchins will eject their sex cells simultaneously.  E: However, this is an issue because evidence for the effects in human behaviour remains speculative and inconclusive. It is not always suitable to generalise results of animal studies to humans due to the more complex nature of humans in comparison to non-human animals.  L: As a result, the credibility of the research and the generalizability of the research to humans is questioned. |