

Biological factors
influence human
relationships



Abraham Maslow, a humanist psychologist claimed that a basic human being desires to be accepted by others as relationships are a significant source of happiness or unhappiness. People live in families and form other groups such as friendships and partnerships to define themselves in terms of being important to others as relationships tend to influence our emotional state as well as our health (#1).

Different types of relationships have different effects on an individual; a close relationship is one where a partner's actions, thoughts, behaviors and emotions influence their spouse's. When studying loving relationships, Berscheid and Hatfield (1972) have come up with a theory that distinguishes between two kinds of love: passionate and companionate love. Passionate involves sexual feelings of attraction and intense emotions, while compassionate is a trusting warm and tolerate affection for their partner.

Attraction plays an important role in close human relationships. Evolutionary theories argue that all humans and animals display very similar behavior when being attracted to one another. The theory claims that the whole purpose of sexual attraction is to procreate and produce offspring as it is a biological way to ensure that genetic material from one generation is passed on to the next. In the terms of animals, sometimes after mating and reproducing offspring, only the females are left to take care of the new generation. However, in other situations, there are longer lasting relationships. There is not a one-sided explanation for why this is, but different levels of analysis: the biological, the sociocultural and the cognitive offer varying explanations to how much we are attracted to someone to

begin with, and whether or not they are a friend, a potential romantic or even a sexual partner (#2).

An anthropologist, Helen E. Fischer (2004), argues that adrenaline, serotonin and dopamine play a large role in one's biology in creating a biochemical reaction that leads to human romance and passion. Fischer claims that romantic love is not necessarily an emotion and that it has been engraved into our brains as a result of millions of years of evolution.

In 2003, Fischer et al. carried out a study to investigate blood flow in the brains of 20 men and 20 women using an fMRI scan (functional magnetic resonance imaging). The aim of this observation was to determine what biological factors were responsible for them being attracted to their partners. The participants chosen were madly in-love and were asked to look at photographs of their beloved, as well as of their neutral acquaintance(s). The two types of photographs were the controlled variables. Before the fMRI scan took place, the participants filled out a questionnaire called the "Passionate Love Scale" with statements relating to how they felt about their being with their beloved. The questionnaire was given so that when they scanned their brain activity, they would be able to compare it to what they had responded in the questionnaire.

During the experiment, first the participants looked at the photograph of their beloved for 30 seconds while getting an fMRI scan of their brain, followed by a task which would distract them from what they had just seen and felt before looking at a photograph of a neutral acquaintance. There were 6 trials to this experiment. As results, the researchers discovered that a

pleasant stimulus in the participants' brains had activated the brain's "reward system" which showed activity.

The researchers further found that the "brain's reward system" was most active when the participants had viewed pictures of their beloved. They also found that the more passionate the lovers were the more active was their brain activity. This justified Fischer's hypothesis of how there is a correlation between the way the participants react towards their lovers and the brain activity. (#3)

The use of technology to conduct this experiment is a factor that would be beneficial towards obtaining the most accurate results as it would show the brain and the activity in the brain clearly. On the other hand, the fMRI is only able to look at the blood flow in the brain, and not the activities of individual neurons which play a critical role in the functioning mind. When studying the brain, it is important to consider that each area of it that shows activity through the fMRI may represent many different functions, therefore it is difficult to be specific about what type of brain activity may be represented on the scan.

The question of how Fischer et al. chose their target population of participants who are madly in love still stands. Asking may have led to inaccurate results since it would have been possible that the participants may have been dishonest about their relationship status. Furthermore, although the "Passionate Love Scale" played a helpful role comparing the brain activity and what the participants had responded, it may have also been a possibility that by writing down how they felt about their beloved may

have increased their love towards them even more, therefore, showing more brain activity than there may have been. Moreover, every individual may not necessarily react or feel the exact same emotions at the same time when thinking about their beloved. It may have been the case for some, that they just had an argument or were not on good terms.

On the other hand, the use of controlled variables is beneficial towards conducting a fair experiment, as well as determining a cause-and-effect relationship between the photograph of their beloved one and the brain activity. Conducting 6 trials is also an advantageous strategy used as obtaining the mean for all 6 results for each participant would help in obtaining the most accurate results.

James (1890-1950) claims that subjective emotional experience is when there is physiological changes that accompany an emotion arousing stimulus. However, others like Lazarus (1991), state that subjective emotional experience is merely the end result of cognitive appraisal, the way people interpret and think about the situation in which they find themselves.

Dutton and Aron (1974) conducted a study on attraction based on the cognitive level of analysis, where they hypothesized that “ men who experience an increase in arousal in the presence of an attractive woman are likely to identify the woman as the cause of their feelings.”

The study consisted of an attractive female confederate who approached the participants (34 male visitors to the between the age of 18 and 35 years old) and single. A few of the participants stood on a high, swaying suspension

bridge (aroused) or while they stood or sat in a park near the entrance of the bridge, 10 minutes after getting off the bridge (not aroused).

The confederate asked them to participate in what she described as a study of creativity and was unaware of the real purpose of the study. Then, the men were asked to tell a story in response to an ambiguous picture. They were led to believe that the stories were being used to measure their creativity. If they involved sexual themes in their stories, the researchers used this as an indicator of arousal. The more the number or intensity of sexual themes, the greater the sexual arousal was assumed to be.

The confederate offered all participants a phone number, so the participant could call at a later time for more details about the study of creativity. If a participant decided to call the phone number it recognized as evidence of attraction and an interest on the part of the male participant. In the presence of an attractive female confederate, men in a state of high arousal wrote stories containing more sexual imagery than did men in a state of low arousal (#8).

Although the findings confirmed the researchers' hypothesis, there are some ethical considerations to be attentive about. Firstly, the participants and the confederate were not debriefed; therefore this can be regarded as unethical. However, during the study, this minimized experimenter bias, by ensuring that she would not act differently towards men in the two groups that could further cause arousal. Furthermore, the men may have naturally found her attractive, whether they were aroused or not. The sample of the target population of males throughout the age group chosen cannot represent the

entire male population, and that every man is more attracted towards someone when aroused. It is age-group limited, and it also excludes women, which is a cause of concern. Furthermore, the research had been conducted in a field setting which is a positive factor as it counters ecological validity. It also minimized participant bias and avoided the danger of participants trying to behave a certain way.

Another study which was conducted by Kiesler and Baral (1970) explain the theory behind attraction through the cognitive level of analysis as well. The researchers carried out an experiment on self-esteem to provide an answer to whether or not people would change their perception of themselves when they seek a partner who is very similar to them, and whether or not this would affect who they choose as a partner. During the experiment, a mock IQ test was given to a number of men divided into two groups. They also gave them fictitious scores after the test. The first group was told that they had scored the highest scores ever seen. The second group was told the exact opposite—that they had scored outstandingly low on the test and that there must have been some error in their calculations and were asked to redo the test again in near future.

After, they were asked to wait in a room where they were given their pay for volunteering for the study during which, a very attractive woman walked into the room and the researchers observed that the participants who were told that they had scored high on the IQ test seemed to engage into a conversation with the woman faster than the men who had been told that they had performed low. Kiesler and Baral concluded that the self-esteem boost that the first group of men had gotten found it easier to engage in a

conversation with the woman as compared to the men who had been told that they scored low. (#5)

Although the observed results of this experiment justify Kiesler and Baral's hypothesis, there are factors which may have caused the results to be unreliable. For example, instead of being told that they had scored either a high or low score on their IQ test, the researchers could have had women involved who would rate which group of men they would think would be the most or least attractive since the results that they obtained from their IQ tests may not have made much of a difference on their self-esteem towards the attractive woman who had walked into the room. Secondly, it is important not to generalize all the participants, as maybe some would have not found the same woman as attractive as the others, even if they had scored a high score on the test. Similarly, someone who may have scored low on the test could have found her more attractive than someone who had scored high, and thus been more motivated to approach her than the other. Furthermore, it would be safe to not confidently conclude that the reason for why they had approached the woman was because they had been attracted to her-as it could be that some men are more open and others may have been more reserved. Moreover, men who may be in a relationship are generally less likely to approach an attractive woman albeit their high IQ test scores. It may have also been a good idea, to include a control group where participants were given average scores to ensure if it really had been self-esteem that encouraged them to approach the woman.

Kiesler and Baral's experiment justifies the cognitive perspective of looking at attraction, but at the same time, getting an "ego-boost" may have also

resulted in more levels of adrenaline, which was one of the three main neurotransmitters that Fischer claims plays a vital role in human relationships. Wedekind et al. carried out an experiment in 1995 to identify if there were other biological factors that may cause or even affect who people are most attracted to.

Wedekind et. al (1995) wished to research whether or not our body odour plays an important role in attraction. Wedekind tested the gene called major histocompatibility complex (MHC) related to immune system in order to study mate selection. In genetics, MHC genes are known to be co-dominant, which means that both of the sets from the inherited genes from parents have an effect on their child's immune system. Therefore, the more diverse the MHC gene, it is believed that the stronger the immune system.

For this study, the researchers chose a target population of 49 women and 44 men who had a wide range of MHC genes. Wedekind gave each male a clean shirt and asked them to keep wearing it for two nights straight, without taking it off to ensure a strong body odour. They also gave them odour-free aftershave and soap to ensure their natural smell as much as possible. They were also asked to avoid any types of spicy food.

After two days, the men were asked to return the shirts and the women were asked to return in the middle of their menstrual cycle-as it is during this time that their sense of smell is at its best, and then the seven boxes were shown to them. Three of the seven boxes contained a shirt from men who had MHC similar to the woman's own, another three contained shirts from MHC

dissimilar men and one remained as an unworn shirt, which was the controlled variable.

The women were then asked to rate which of the smells were pleasant and which ones were unpleasant. The results showed that the women that participated in this study preferred the scent of men who had dissimilar MHC to their own. However, it is also important to consider that this preference was reversed if they were taking oral contraceptives. This is related to a situation similar to that of mice. When a female mouse is pregnant, she is attracted to the familiar odour of male mice that have a similar MHC because by nesting with relatives, the mothers get aid with nursing her young, as well as protection from other dangerous males.

What this may show, is that the results from Wedekind may help to understand the difference in women when they are taking contraceptives (which raises oestrogen levels in the body), to those who are pregnant and also to those who preferred the odour of MHC-similar males. (#4)

When conducting the experiment, it becomes different to be sure that the men used the non-scented aftershave or soap, as they might have. Moreover, some men excrete more odour scent than others, depending on their physiology and biology-so although this experiment is well conducted, there are certain factors which cannot be controlled and therefore limit the end results. Another suggestion may be to increase the participant numbers so that more trials can be conducted to ensure more accurate results. The controlled variable is a beneficial trait added to the study as it allows a more precise cause-and-effect relationship in determining whether or the

experiment is valid. Furthermore, during the time in which the women returned (which was in the middle of their menstrual cycle), it could be possible that the odours from the shirt would have diffused.

Apart from biological factors, it is also important to consider other levels of analysis such as the sociocultural point of view. A large cross-cultural study conducted by Buss et. al (1994) involved giving out two questionnaires to 10,000 people asking about their ideal mates. The response was from 37 different cultures. Researchers found that the results were close to being strikingly similar in terms of the responses. In 36 out of the 37 different cultures, women had ranked financial factors as more important than men. In all 37 cultures, women stated that they preferred older mates while men preferred younger. In 23 cultures, women did not consider chastity as a trait more important than men had considered it. The degree of agreement in gender variations across cultures allowed the researchers to conclude that mate selection preferences can be regarded as universal, maybe from different evolutionary pressures on both, men and women (#6).

This study expresses both, a sociocultural as well as a biological analysis on what attracts different people from various backgrounds. This supports the evolutionary theory of attraction being a biological trait engraved in every individual's being to be able to reproduce and pass on genetic material from one generation to the next. At the same time, there are other factors which should be taken into considering whether concluding whether or not Buss et. al's results are reliable. Firstly, it is important to understand that different cultures do have different insights on what is attractive and what is not since not everyone can be generalized to the same degree. Furthermore, it is

important to consider which parts of the world, or countries the researchers had sent the questionnaires to, to be able to make a claim of whether or not attraction is universally the same to everyone. Moreover, when people are being asked to answer questions, they may answer in a way that they think is right, instead of answering what they actually prefer in a partner, especially in cultures where there are certain norms by which individuals are expected to abide by, they may think that the way they have been taught is the right way instead of making a judgment on their own preferences.

Other biological factors, such as hormones also play a role in human relationships and attraction. Oxytocin is a hormone which is best known for its roles in mate bonding, sexual reproduction, and specifically for bonding during and after childbirth.

Vasopressin is another hormone responsible for the regulation of glucose, water, and minerals such as salts in the blood system for mammals. However, some vasopressin hormones are also released directly into the brain. Many conducted experiments suggest that this hormone plays an essential role in social behavior, bonding, and maternal responses to stress, similar to oxytocin.

Winslow et al. (1993) conducted an experiment on laboratory prairie voles on vasopressin, a hormone which is released during sexual intercourse. Prairie voles tend to form bonds with their partners and also have more intercourse than is necessary for reproduction. Male prairie voles were given a drug that suppressed the effects of the hormone vasopressin, and the results showed that not long after, they lost their devotion towards their mates and no

longer protected them from other potential suitors. Therefore, with these results, the researchers concluded that the hormone vasopressin plays an important role in males' mating behaviors and attachment (#7). Similar to Winslow et al. (1993), there was another study conducted by Morhenn et al. (2008) on another hormone, Oxytocin, also known as the "love hormone" that can influence trust in relationships. Researchers randomly assigned 96 students to three groups, where they could compare the levels of oxytocin in their bodies by obtaining blood samples after getting massages. Afterwards, participants played a trust game based on how much money they would give to another participant knowing that this money could be tripled and that the other participant may share the profit. Results showed that women were more likely to show increased levels of the hormone as compared to men and the participants upon receiving the massage showed more trust. The researchers concluded that the massage allowed the levels of oxytocin in their bodies to increase, therefore increasing their levels of trust (#10).

Winslow et al. gave some significance to the hormone vasopressin, although when considering animal research, it cannot always be applied to humans as not all may respond the same way, therefore it makes this study some-what limited in terms of applications. This is because their deoxyribonucleic acid (DNA) is not the same as ours, so what affects them may not necessarily affect us. In addition, this experiment can also be considered as unethical towards animals, as it is disruptive towards their natural and biological state. It could have a negative effect on them which may lead to other consequences. At the same time, it is difficult and most unethical when if humans were used as well. Therefore, it is to some extent, understandable

why scientists and psychologists resort to using lab rats and mice as subjects, but at the same time the results are mostly very limited. In comparison, the study conducted by Morhenn et al. showed more reliable results as the participants were human, hence it would be easier to apply the same theory on more individuals than the vasopressin hormone experiment conducted on the animals.

Morhenn et al.'s research suggest that higher levels of oxytocin causes more trust, which further plays an important role in human relationships. However, other sociocultural factors may also determine who someone is interested in, simply by seeing them more than other people, which and having a higher trust for them. This is known as the " mere exposure effect".

A study conducted by Moreland and Beach (1992) is a sociocultural explanation to attraction and relationships by exhibiting the " mere exposure effect". This theory claims that the more someone see of an individual, the more attracted they are towards them. They had female confederates attend different classes of different degrees, and they did not interact with any of the other students, or the professors. Different students went to different classes, some attending fewer than others. At the end of the course, when the students were asked who they thought was most attractive out of all the female confederate students, the general population who were asked rated the one who had attended the most classes, even though they did not interact on any levels (#9) and (#10).

In this case, it could be that students who had rated the female student who had attended the most classes as most attractive, could have been simply

due to the fact that it was an easier answer for them and not that they had an actual attraction towards them. Moreover, the classes which the female student confederates had attended could have had an effect on the answer of the other students. For example, there may have been more males attending a specific class than another, so it is more difficult to compare the quantitative amount by concluding how many other students had actually rated the one who had attended the most classes as the most attractive. On the other hand, the fact that this experiment was conducted in a natural environment has its benefits as none of the other students were expecting a question in terms of attraction to be asked, therefore the students did not feel as under pressured as they would have if they were being interviewed under a laboratory surrounding.