

The Mating Game

**WHY MEN WANT SEX
& WOMEN NEED LOVE**

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Chapter 1

Sex On the Brain



It says, 'Then insert tab A into slot B.'

Passion, infatuation, romance, 'the hots', obsessive love, beer goggles...these are the words we use to describe those feelings of ecstasy, elation, bliss and rapture that almost every person will experience in some way at some time in their lives. With them come the feelings of anguish, distress, pain, agony, torment and grief. For thousands of years, experts have tried, with little success, to define romantic love, usually concluding that it must be controlled somehow by forces outside ourselves, such as the mystical, supernatural or spiritual. Yet we have no difficulty in pigeon-holing other human emotions, like depression, anxiety, obsession and fear.

Since the 1970s, humans have experienced a deep spiritual yearning for love. This yearning is caused by the breakdown of the social structures that gave us intimate connections with

friends, family and lovers, and was the norm for thousands of years. We evolved as a species that cared for our young, protected, loved and depended on each other, and stuck together as social and family units. The older generations cared for the children, while the middle generation worked or collected food. In the evenings, the older generations told children stories and taught them about their heritage and about life. This kind of family structure now only exists in primitive cultures, parts of the Middle-East, Asia, the Mediterranean and in Third World cultures. And as more and more people are staying single or living alone, this cultural chasm continues to widen. For a million years or more, societies have been structured to bring men and women together; today's societies, however, are driving them apart. The erosion of the basic family structure has led to loss of values, kids growing up without fathers, and emotional chaos.

Same Goals, Different Agendas

Men and women have very different agendas when it comes to sex and love, and these are deeply embedded in our ancient

**Victims of love gone wrong fill the
depression and suicide clinics everywhere.**

past. In basic terms, today's men are turned on by visual images and by the signs of a woman's health, fertility and youth, while women are turned on by the markers of a man's power, status, commitment and material resources – just like their ancestors were. In fact, nothing much has really changed for hundreds of thousands of years in terms of our sexual urges and drives. This can be an unpopular idea in a politically correct world in which it has become fashionable to say that men and women want the same things in life and have the

same motivations, preferences and urges, but as you read on, you will see that this is simply not true. In fact, deep down you *know* it's not. This myth is perpetuated by power-seekers, such as bureaucrats, Church leaders, feminist groups and other politically motivated individuals. It may be politically correct to say that men and women think the same way and want the same things, but if you have had any experience living with them, working with them or managing them, you'll know that it isn't true.

The Power of Love

David Buss, professor of psychology at the University of Texas at Austin, is internationally recognised for his evolutionary research on human sex differences in mate selection. He and his team searched for evidence of romantic love in 147 cultures. They discovered empirical proof of romantic love in cave drawings, manuscripts, poems, songs and books. Most people see only the positive sides of love when they think about it – they imagine staring into a lover's eyes, holding hands, singing love songs, making love and warm, fuzzy feelings, all the 'happily-ever-after' stuff – but love also has a dark side. Buss and other researchers found evidence spread throughout human history of love potions, love charms, love spells, suicide and murder motivated by love won or lost. In fact, one in four murders is the result of love gone wrong. Spouses, lovers, rivals, stalkers and jilted lovers everywhere die as a result. Almost every culture has its equivalent of the Romeo and Juliet story. The dramatic urge to love fills us with exhilaration, despair, fear or revenge, often all at the same time.

Love is about chemical reactions in the brain.

And because romantic love is universal and every human culture on earth has it, there must be a biological basis for it. In other words, it can't simply be a cultural tradition, like idol worship or religion; love is something that is very powerful and is hardwired into each of us.

The Biology of Love

Scientists who have been researching how the human brain operates when a person is in love have concluded that there are three distinct brain systems for mating and reproduction – lust, romantic love and long-term attachment.

Each of these systems is associated with distinct hormone activity that cause specific feelings and behavioural changes in lovers. When you think of love in terms of these three systems, it makes it easier to follow what stage a person is in and to better understand their actions.

The purpose of this chapter is to help you understand the basic brain functions that govern lust, romantic love and long-term attachment. We have attempted to keep the explanations as brief and simple as possible. Where we talk about specific areas of the brain it's important to understand that the brain regions discussed are usually part of an overall brain network, and we thank Professor Graeme Jackson of the Brain Research Institute in Melbourne for his suggestions in this area. We have simplified things here to make them more accessible to our readers; at the same time, we are conscious of not oversimplifying these ideas and concepts. It is vital to have this knowledge of the research because it's referred to throughout this book. We use medical terminology for the technically inclined, but you will only need to understand its significance in relation to your love life. We will be discussing principles that operate most of the time for most people, not how minorities or the exceptions behave.

Love has been shown to be the result of a specific group of chemicals and brain circuits working in specific areas of the

brain. In simple scientific terms, love is triggered by a combination of brain chemicals, including dopamine, oxytocin, testosterone, oestrogen and norepinephrine; in much the same way, these chemicals drive other mammals to find suitable partners. Once our brain has identified a suitable partner based on certain criteria, which are discussed later, the brain goes into overdrive to produce the chemicals necessary to create the environment to attract that person.

Throughout human history, marriages were an arranged event based on wealth, status, family rivalries, tribal groups and politics. Today, this approach has generally disappeared from the Western world and most people now marry for love.

When it comes to mate selection, humans focus their attention on just one person. This distinguishes them from most other animals. A courting male pigeon, for example, will puff up his feathers and approach as many potential partners as his energy will allow. Humans, however, usually have a shortlist of candidates but intensely target just one.

Love At First Sight

The phenomenon of 'love at first sight' has been scientifically proven and affects most animal species in much the same way.

Ray was shopping in the supermarket when he glanced between the cornflake packets into the confectionery aisle. What he saw overwhelmed him and he experienced a euphoric feeling, almost as if he was intoxicated. Standing there was a woman who simply captured his heart. She was not beautiful in the usual sense, but there was something unique about her and the way she moved. All he knew was that he felt magnetically drawn to her. Just looking at her filled him with excitement and gave him butterflies in his stomach.

While he experienced these feelings of elation at discovering her, however, he had at the same time a sense of despair because he would never have her.

If you've ever experienced love at first sight, your brain was producing huge amounts of the chemicals dopamine and norepinephrine, which make you feel almost as if you are on drugs. The same things happen to other animals. Take, for example, the female prairie vole, which is similar to a desert rat. If you expose a female prairie vole to even a tiny scent of male vole urine, she experiences exactly the same chemical reaction as humans do: a surge of dopamine and norepinephrine. One study demonstrated that when female sheep that are on heat are shown images of male sheep, norepinephrine levels in their brains surge. While this effect lasts for seconds or minutes for most animals, it can last for months or years in humans.

Scientists now agree that love at first sight is a real phenomenon. Scientists working in this area also believe that in a stable society in which people are not under the threat of death or war, lust, romantic love and long-term attachment may be the best and most efficient way to ensure species survival.

Darwin Made Me Do It

Lust is brought on by surges in sex hormones, such as testosterone and oestrogen. These hormones cause an urgent push for physical gratification. During lust, two key parts of the brain become active – the hypothalamus, which controls our primordial drives, such as thirst and hunger, and the amygdale, which is a centre for arousal. Dopamine is heavily secreted during lust and it triggers the production of testosterone, causing sexual attraction to occur. It happens when you first see someone and have an overwhelming urge to 'have' that person.

A study conducted in 2006 at the University of Chicago demonstrated that even during a casual chat with a female stranger testosterone levels shoot up by a third in men, and that the stronger this hormonal reaction, the more dramatic the changes in a man's behaviour. The study also showed

testosterone readings in married men and fathers are significantly lower than in single males who are 'playing the field' because the fathers have moved into a nurturing, parental role and have higher oxytocin levels than single men, who are still searching for somewhere to pass on their genes.

Lust obviously evolved to lead to procreation and to ensure the survival of the human species and would have been necessary in extremely difficult survival circumstances when there was no time for romance. Also, human females can only bear one offspring a year, which means that, without lust, the human species could be threatened with extinction – because we are slow reproducers, Mother Nature made us enthusiastic procreators. This is why people in dangerous and threatening situations, such as wartime, can suddenly find themselves lust-ing after each other, even though they are strangers. If their lives are in danger, they have the immediate urge to pass on their genes.

In summary, lust, love at first sight and the obsessive, goal-driven aspects of early love are behaviours that evolved to speed up mating and provide a better chance for successful human reproduction.

Let's Stick Together

Testosterone is the main hormone responsible for sex drive, and men have 10–20 times more of it than women. This is why male sex drive is strong and so urgent. Testosterone makes men hairier, bigger, stronger, more aggressive and hornier than women. But men have significantly *less* oxytocin than women. Oxytocin, known as the 'cuddle hormone', is released in large quantities in men and women during orgasm. As quickly as a man can get an erection his oxytocin dissipates, which is the reason why after-sex cuddles have great importance to women and limited appeal to men.

A study in 2006 by Rebecca Turner, PhD, professor in the Organizational Psychology Division of Alliant International

University in San Francisco, showed that this hormone is the glue of human emotional bonding. When people are pair-bonding – or ‘falling in love’, as we call it – oxytocin levels are high. This is the hormone that gives us the warm, fuzzy feeling we have for the person of our desire. Having higher levels of oxytocin than men is a major reason why women fall more deeply in love at the start of a new relationship than men. The more oxytocin they produce, the more nurturing they will be and the deeper they will bond with someone. Just hearing their lover’s name, an odour associated with them, fantasising about them or hearing a song connected with them raises oxytocin levels. Expensive outfits, perfect make-up, loads of jewellery and a new sports car cannot disguise a woman’s emotional condition. If she feels loved and adored, her hormones push blood into her cheeks, making her ‘glow’, and she will radiate warmth. If she feels unloved and ignored, however, that’s easy to see, too.

**What is the difference between
men and women?**

**A woman wants one man to satisfy
her every little need.**

**A man wants every woman to satisfy
his one little need.**

The studies by David Buss showed that when couples are in the falling-in-love phase, men’s testosterone levels decrease, while their oxytocin levels rise to make the bonding process quicker. This makes men softer, gentler and more easy-going. At the same time, women’s testosterone levels rise with the excitement and confidence they feel at the start of a new relationship. This increased testosterone makes women hornier, giving the couple the illusion that male and female sex drives must be the same. When this ‘shagathon’ period ends, about three to nine months into a new relationship, their sex drives

return to the 'default position', leaving a man with the idea that she's gone off sex and giving her the impression that he's a sex maniac. Many relationships end at this point.

Why Lovers Are So Crazy About Each Other

Josephine, a 33-year-old single mother, had devoted her life to bringing up her children by herself. After six months in her new job, she attended the company's annual Christmas party on a cruise ship in Sydney Harbour. She looked glamorous when she arrived at the docks and received many compliments and admiring gazes from male staff. This boosted her confidence and made her feel beautiful. As the ship cruised around on the moonlit water, she was introduced to Rick, a handsome new male executive from the Melbourne office. As they shook hands, her heart started racing. He was tall, dark, handsome, made her laugh and it seemed as if he was as attracted to her as she was to him. After a magical night of dancing and dining, they talked until the early hours of the morning and spent the entire next day and evening together. For Josephine, it felt as if some kind of magical spell had been cast over her.

Returning home to the kids was wonderful, but her mind was full of thoughts about Rick and their time together. She wondered if he missed her as much as she missed him. Over the next few days she started to lose weight and couldn't eat – all she could do was think of him and the beautiful memories. She began phoning him every hour just to tell him she was thinking of him, and she sent him text messages in the early hours of the morning. She began buying him gifts to show him how much she cared. Her kids started to feel neglected and their behaviour began to change for the worse, but she didn't seem to care. She cancelled her son's dental appointment and used the money to buy a plane ticket to fly to see Rick. She thought, Wasn't it her time to think about her own needs and to have a life as well?

In many ways behavioural changes during romantic love resemble a psychosis, and from a biochemical standpoint, passionate love closely imitates substance abuse. Dr John Marsden, the head of the British National Addiction Centre, found that love is addictive in similar ways to cocaine and speed. He concluded that romantic love is a 'booby trap', intended to drive partners together long enough to bond. Anthropologist Dr Helen Fisher, author of *The Anatomy of Love*, described falling in love as 'a distinct set of chemical events occurring in the brain that have similarities with mental illness'. According to Dr Fisher, exactly the same brain circuits that become active when you take cocaine light up when you're in love, and you experience an intense elation, just like when you're high on drugs. Researchers have also connected romantic love to the signalling pathways that use the hormone dopamine, a chemical messenger closely tied to the state of euphoria, craving and addiction.

I Get a Shiver Down My Backbone

The chemicals released from the brain during new love result in a variety of physical feelings and reactions that around 90% of new lovers report to have experienced. These include sleeplessness, loss of appetite, flushing, exhilaration, awkwardness, euphoria, butterflies in the stomach, fast breathing, dizziness, weak knees, heart palpitations, sweaty palms and stuttering. Many of these reactions are linked to the fear of being rejected by the loved one, so it becomes like an evolutionary double whammy of excitement and fear, both at the same time. New lovers not only feel these emotions, they constantly scan the face of their beloved looking for signs of reciprocation.

Carole King summed up perfectly the chemical reactions we have to falling in love in her 1970 song 'I Feel the Earth Move Under My Feet'. This song describes how she felt hot and cold, lost emotional control, felt her heart start trembling and saw the sky come falling down whenever her beloved was around.

These are also common responses to drug addiction.

Love can be a wonderful rollercoaster ride and it happens unexpectedly for most people. They have little warning and no apparent control over it. The feelings come from the primitive part of the brain known as the cerebral cortex, or grey matter, and overpowers the rational, thinking part, making lovers behave in irrational ways – in the same way that the fight-or-flight response makes a person run when confronted by a lion, as opposed to calmly thinking about an escape plan.

The euphoria of love has inspired artists to produce haunting love songs and melodies, and powerful, touching poetry, but the intensity of love can also drive some of those under its influence to jealousy and paranoia. Recent scientific evidence shows it can even dramatically improve our health, with further studies showing it is capable of curing cancer or other diseases. Love even motivates us to continue to live with people whose behaviour is detrimental to our well-being, as in the case of abusive partners.

I Can't Sleep, I Can't Eat

People in the 'falling-in-love' stage are commonly called 'lovesick'. They say they can't eat, don't sleep properly and show repetitive, compulsive behaviours, such as calling their beloved 20–30 times a day. These behaviours have now been linked to the combination of low levels of serotonin and high levels of oxytocin. Serotonin is the neurotransmitter that gives us heightened feelings of awareness, sensitivity to our surroundings and an overall feeling of well-being.

Depression and eating disorders are also associated with low levels of serotonin and anti-depressant medications aim to raise these levels. Women naturally have around 30% more oxytocin than men and this, combined with lower levels of serotonin, can explain why women are more inclined to become 'crazy' about someone, and even intensely obsessive.

**'Love is only the dirty trick played on us
to achieve the continuation of the species.'**

W. Somerset Maugham

In 2007, Serge Brand and his colleagues at the Psychiatric University Clinics in Basel, Switzerland, interviewed 113 subjects, all of whom were aged 17. Of those 65 said they had recently fallen in love. Brand found that the love-struck adolescents slept less, acted compulsively more often and had 'lots of crazy ideas and creative energy'. The 'in-love' teenagers were more likely to engage in risky behaviour, such as reckless driving or bungee-jumping. Brand showed that teenagers in the early stages of intense romantic love did not differ from patients having a hypomanic episode. In other words, it's sometimes difficult to differentiate teenagers in love from people who are commonly thought to be crazy.

**If you've ever said you were 'crazy'
about someone, you were spot-on.**

What Brain Scans Reveal

Brain-imaging techniques such as functional magnetic-resonance imaging (fMRI) and magneto-encephalographic scanning (MEG) have opened up a whole new world of possibilities in understanding humans because they enable researchers to study the working human brain without harming the patient.

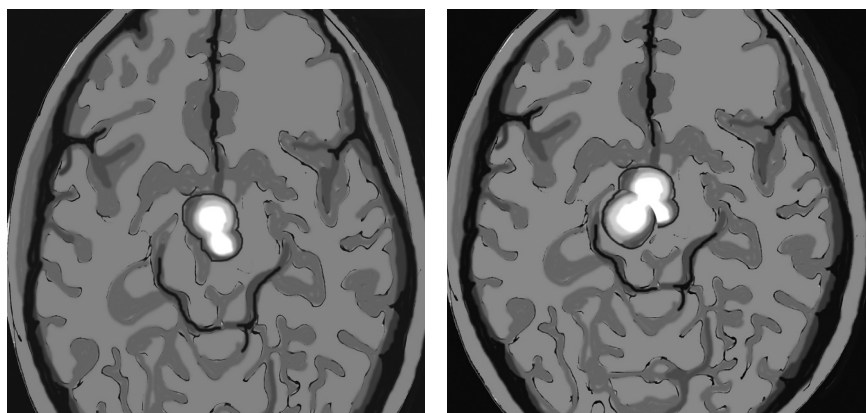
The study of love and sex in the brain gained momentum in 2002, after English neurobiologists Andreas Bartels and Semir Zeki of University College London conducted a study of young men and women who said they were in a new relationship and described themselves as 'madly in love'. When shown a picture of their lover, their brain activity pattern was signifi-

cantly different from when looking at a picture of a close friend. The brain scans showed that romantic attraction activated those areas of the brain with a large concentration of receptors for dopamine. Dopamine, you will recall, is the neurotransmitter that affects pleasure and motivation, and is often called the 'happiness hormone'. High levels of dopamine and norepinephrine are linked to heightened attention, short-term memory, hyperactivity, sleeplessness and goal-orientated behaviour. When couples are first captivated by each other, they often show the signs of surging dopamine: increased energy, less need for sleep or food, focused attention and exquisite delight in the smallest details of their new relationship. Bartels and Zeki compared the MRI brain-scan images they took of people in the different emotional states of sexual arousal, feeling happy and cocaine-induced euphoria, and found them to be almost the same.

Might As Well Face It, You're Addicted to Love

The following brain scans show how being 'madly in love' activates the same areas in the brain as addiction to cocaine.

So whether you are in love or high on drugs, you will feel



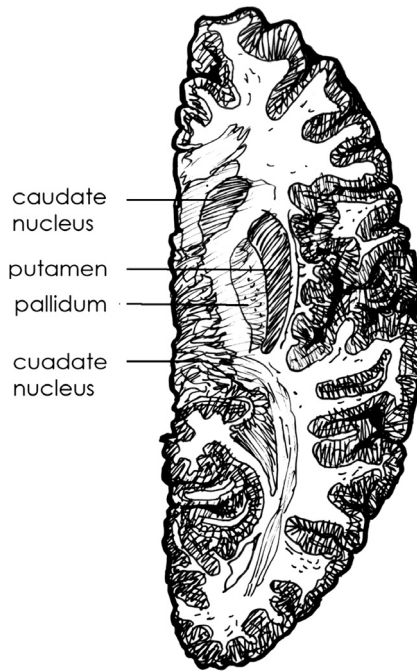
The brain scan on the left shows the region of the brain that is activated in 'crazy-in-love' people. The scan on the right shows the activated regions when using cocaine.

about the same. The scans also revealed that mothers who were looking at their babies had identical brain activity as people who were looking at their lovers. Bartels and Zeki concluded from this that both romantic and maternal love are linked to the perpetuation of the human species, because lovers and babies carry the promise that your DNA will continue.

The Geography of Sex and Love In the Brain

In 2005, Dr Lucy Brown, professor of neuroscience at the Albert Einstein College of Medicine in New York, teamed up with one of the world's most prominent biological anthropologists, Helen Fisher of Rutgers University in the US, and conducted studies with MRI brain scans on 17 young men and women. These were people in a new relationship and described themselves as being 'newly and madly in love' – that is, they were in either the lust or early romantic love stages. Their MRI research explained the physiological reasons behind why we feel what we feel when we fall in love – why love is so powerful and why being rejected is so painful and depressing.

They studied an area in the brain associated with cravings, memory, emotion and attention called the caudate nucleus, and the ventral tegmental – the part of the brain from which dopamine cells are pumped to other areas of the brain. These areas all lit up on the MRI scans as subjects viewed images of their lovers. They also compared the MRI data with the other studies on male penile-erection responses to images of women, and analysed data on both human and animal couples that had been together for a long time. They found that when you fall in love, the ventral tegmental floods the caudate with dopamine. The caudate then sends signals for more dopamine, and the more dopamine you get, the higher and happier you will feel. Fisher and Brown also confirmed that 'crazy love' causes a sensation similar to a substance-induced high because of the hormone activity.



A cross-section of the human brain

The caudate, they discovered, is the brain area connected with romantic love. They found that long-term attachment was centred in the front and base of the brain in the ventral putamen and the pallidum. Feelings related to lust and sexual arousal occupy different areas, mostly located on the left-hand side of the brain. The important point is that this research removes the mystery of love in the brain and allows us to be more objective about what love really is.

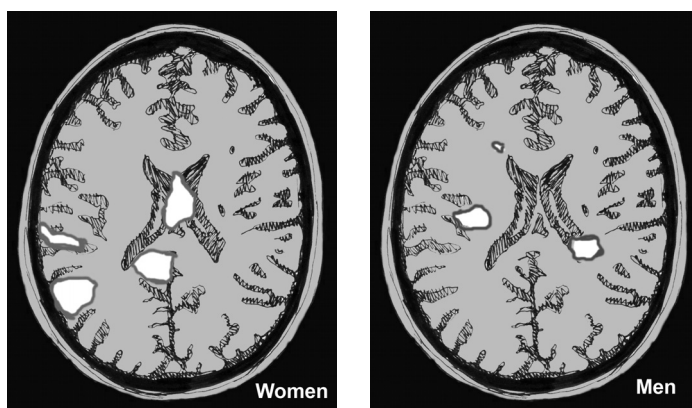
Love is a chemical cocktail of happy drugs, and people who are addicted to this cocktail are known as 'sex addicts'.

Why Men and Women See Love Differently

Fisher and Brown, both separately and together, analysed the brain scans of over 3,000 'madly-in-love' college students,

taken while they looked at a picture of their lover. They found that the women in the study showed more activity in the caudate nucleus – as mentioned, an area in the brain associated with memory, emotion and attention – the septum, also called the ‘pleasure centre’, the posterior parietal cortex, which is involved in the production of mental images, and with memory recall. The men in the study showed more activity in the visual cortex and visual processing areas, including one area responsible for sexual arousal. Bartels and Zeki came to the same conclusions in their study.

The next brain scans illustrate the research carried out by Dr Brown and show where love sits in the brain and why men and women think so very differently about it. These are scans of men and women looking at images of someone they were madly in love with.



Images of love. Men and women looking at pictures of their beloved. White areas are active zones.

As you see, men have less lit-up areas than women, but when those areas are viewed in colour, they show men's areas to be more intensely active than women's larger but less active areas. Women not only have more areas being active but they are in completely different locations to men's. This evidence shows why men and women have very different views of love relationships.

Another study showed erotic photos to people as their brains were scanned, but Brown and Fisher found none of the ‘in-love’ activity areas shown in the above scans. As mentioned earlier, they found activity in the hypothalamus, which controls drives like hunger and thirst, and in the amygdale area, which handles arousal. The bottom line is that brains in love and brains in lust don’t look much alike because they each use different systems.

In summary, the science shows entirely different processes are being used to evaluate the opposite sex during early love – men use their eyes as the primary tool to evaluate women for sexual potential, while women use memory to assess a man’s characteristics for potential as a long-term partner. Lust and love have different locations in the brain and are *not* the same thing.

How Men’s Brains Rate Attractiveness In Women

When Bartels and Zeki showed images of attractive women to men, they found that men showed higher activity in two regions in the brain: one associated with visual stimuli and the other with penile erection (gee, who would have guessed!). The majority of men are highly visual and constantly watch women, fantasise about them and love to look at porn, so this is no surprise to most of us. When these areas in men’s brains are lit up, the researchers found that the men’s brain areas linked to making moral judgements also diminishes.

**A three-year-old was examining
his testicles while taking a bath.
‘Mom,’ he asked, ‘are these my brains?’
‘Not yet,’ she replied.**

The visual brain network in men evolved over the last million years because they needed to look at women to size up

their ability to produce healthy babies to keep the species going. If a woman was young and healthy, a man would become aroused and start the mating process. This is why men fall in love faster than women – because they are more visually motivated, and visual cues are immediate and send a signal to the brain that activates an instant hormone surge. It also helps to explain why men are more likely than women to fall in love at first sight.

In essence, men use their eyes primarily for evaluating the potential of a woman. When men are turned on, they become flushed with hormones and have erections. These hormones can overtake rational thinking and therefore men can make decisions that may not be in their own best interests. It becomes a situation where his erections over-ride his brain. This is hardly a shock to any woman who has had experience with men. These scans corroborate the research by David Buss showing that these behaviours are a universal, cross-cultural phenomenon.

**'God gave man a penis and a brain but
only enough blood to run one at a time.'**

Robin Williams

How Women's Brains Rate Attractiveness In Men

Studies of women's brain scans revealed something very different to the men's scans. In women, several brain areas associated with memory recall became active when evaluating men for attractiveness. In evolutionary terms, this is an adaptive strategy to remember all the details of a man's behaviour.

For hundreds of thousands of years, women have had the job of raising babies to a stage of independence. Motherhood is a complex job and it is harder for human females than for any other mammal. Human mothers need support and protection when feeding and caring for their offspring. In prehistoric

times, if a woman's partner died, she'd need to expend an enormous amount of energy to find a replacement. Unlike a man's immediate visual approach to evaluating the opposite sex, it's not possible for a woman just to look at a man and know whether he's honest and trustworthy, whether he can hit a moving zebra with a rock from 50 metres or if he'll share the meat with her. The same evaluative process is used by a woman today to be able to remember things such as what a man said yesterday, what he said three weeks or three months ago, how he reacts to children, whether he is kind and generous, how he treats his mother, his employment history and his assets, and she'll use all of this to evaluate his potential as a partner. When a woman studies images of one man, she recalls other men she knows who have similar features and then recalls their personality traits. Her brain then decodes the traits that correspond to the face of the man she's looking at. It's as though she is putting together a mental jigsaw of one man's character using a database of pieces of many other men. This doesn't mean she gets it right; it means that she constructs a mental composite based on the men she knows. While women's brains are recalling data about many men to assess a man's potential as a partner, men just take long, hard and many obvious looks at women. Now you know why women never forget and men are always being caught ogling women.

Around 79% of couples who intend to marry live together, but only 18% of these last more than 10 years.

Why Lust Doesn't Last

Donatella Marazziti, a psychiatrist at the University of Pisa, Italy, investigated the hormonal changes connected to obsessive-compulsive disorder (OCD) with a focus on serotonin, the

chemical that has a soothing effect on the brain. Too little serotonin has been linked to aggression, obsession, depression and anxiety. Drugs in the Prozac family fight these conditions by boosting the chemical's presence in the brain. Marazziti was intrigued by how both the people with OCD and love-struck individuals can spend hours fixating on a certain object or that certain someone, and how both groups often know their obsession is irrational but they seem to have no control over it. She measured the serotonin levels of 20 OCD sufferers against 20 'madly-in-love' people. She then compared the results against another 20 people not affected by OCD and who were not in love. While the 'normal' subjects had the normal level of serotonin, both the OCD and in-love participants had about 40% less of the chemical. The way the scientists estimate this is by the amount of activity of a serotonin transporter protein in their blood platelets. This experiment can explain how early romantic love can often turn into obsession.

Re-testing the same subjects 12–24 months later, Marazziti found that the hormonal differences of lust had disappeared entirely, and their serotonin levels were back to normal, even if the couples were still together. Lovers will swear to each other that they will always 'feel' this way, but their hormones clearly tell a different story. Mother Nature is very clever: she adjusts our hormone levels for just long enough to drive us to achieve her evolutionary goal – to produce offspring.

Using the same method for volunteer selection, in 2005 Enzo Emanuele and his colleagues at the University of Pavia, Italy, investigated whether the chemical messengers, the neurotrophins, were involved in romantic love. They reported that the concentration of nerve-growth factor in the blood exceeds normal levels in infatuated volunteers, and that it increases with the intensity of romantic feelings. Like Marazziti, Emanuele and colleagues also found that after one to two years, all of the love chemicals had gone, even if the couples were still together. Neither the initial intensity of the love feelings nor the concentration of nerve-growth factor appeared to

be an indicator of whether or not a relationship would last.

Interestingly, a study released in 2008 by a team from Stony Brook University in New York, headed by Dr Arthur Aron, scanned the brains of couples who had been together for 20 years and compared them with those of new romantic lovers. They found that about 10% of the mature couples demonstrated the same brain activation and chemical reactions when shown photographs of their loved ones as the 'new' lovers did. So there is hope for some of us.

For 90% of people, factors other than early hormone rushes are needed to sustain a relationship in the long term.

Meanwhile, at Whitchurch Hospital in Cardiff, Wales, biochemist Abdulla Badawy has shown that alcohol also depletes serotonin in the brain. Low levels of serotonin dissolve inhibitions and create an illusion that the ordinary-looking person at the other end of the bar is unbelievably attractive.

All this research shouts a clear message to those looking for long-term love: wait for up to two years before making a long-term emotional or financial commitment to someone – and choose your bars carefully.

But, if all the chemical messengers of intense romantic feelings disappear within two years, what is the chemical glue that keeps some couples together for the long term? All is not lost – we'll discuss this in later chapters.

What Happens When You Get Dumped

One reason new love is so heart-stopping is the possibility and fear that the feeling may not be entirely reciprocal, and that the dream could suddenly end.

In another experiment, Drs Fisher, Brown and Aron carried out brain scans on 40 young men and women who were recently

dumped by their lovers. As in the ‘newly-in-love’ study in 2007 by Brown and Fisher, the researchers compared two sets of images: one taken when the participants were looking at a photo of a friend, the other when looking at a picture of their ex. The results showed that when you look at a photo of someone who has just abandoned you, the brain areas associated with physical pain, obsessive-compulsive behaviour, risk-taking and controlling anger all switch on. They also found that when you get dumped, these brain areas usually light up even more and you become even more attracted to your rejecting partner. As a coping mechanism – similar to the ‘fight-or-flight’ response – your brain gears up for at least one more attempt to recapture your lover’s attention to avoid the pain of being hurt. When, however, you finally accept that you have been abandoned and you come out of denial, the brain areas connected with despair light up.

When you get dumped, your brain wants you to chase your ex even harder.

When the participants in the studies viewed their former lovers’ picture, it also triggered the dopamine system in the brain – the same system associated with pleasure and addiction. This did not happen when they viewed images of their friends. The brain images of those who were dumped also explain why the breakdown of a relationship can trigger serious health problems. When someone is past denial and the happiness hormones such as dopamine disappear, they are replaced with the chemicals that can lead to depression and can reduce the body’s immune system, triggering illness. The rule of thumb is that it takes about a month for every year of a past relationship for you to emotionally ‘get it out of your system’ and for your hormones to return to their normal stress-free, healthy levels. So if a relationship lasted for, say,

two years, it would take two months to get it out of your system and for you to feel you are over it. This explains why elderly people who lose a partner after 50 years of marriage may never recover from what is commonly known as a 'broken heart'.

Summary

In basic terms, sex drive is the result of a cocktail of chemicals released into the blood by the brain, which stimulates the production of hormones, primarily testosterone and oestrogen. The circumstances you are under at the time can also trigger the brain to release these chemicals. For example, a particular song, a special smell or a person who has certain physical features can trigger the chemical release. As we age, these hormone levels, particularly testosterone, decrease. Testosterone injections have become common for older men and women with declining sex drives. We will discuss this more later, but it is important to understand that all romantic ideals, love feelings and the highs and lows you may experience in new love are chemically linked and are not the mysterious, mystical meeting of souls that many people like to believe.

Science is at last revealing things about romantic love, lust, sex and attachment that have been shrouded in mystery and fantasy for thousands of years. This science is like a GPS for love in the brain. Some people become alarmed about this and say that this type of research removes the wonder and excitement of new love and romance. In fact, it does the opposite. By understanding why you are motivated to make the choices you make, and by understanding that love has a scientific and biological basis and is not a mystical force, you can better control your choices and improve your odds in the mating game, in spite of the fact that your brain is hardwired the way it is. Instead of claiming, 'My hormones made me do it,' you can take control of the wheel and decide where you'd like to drive. In addition to your biology, other forces are also at play and

you have significant control over these, which is what you will discover in the rest of this book.

To not understand that love is a series of chemical reactions can leave you exposed to every love-rat who comes along.

When the first car GPS was introduced by BMW, some people protested that it took the fun out of driving and discovering new places. In fact, what the GPS really did was to stop people becoming frustrated and angry, spending time pointlessly in dead-end roads or driving down the wrong roads. It can be fun to be lost sometimes, but with new technology, you always have a back-up plan in your pocket or purse, and that's what's coming in the next chapters.

- In essence, our sexual urges and drives have remained unchanged in hundreds of thousands of years.
- Love, lust, romance and sexual desire are all chemical responses triggered in the brain.
- Science has proved that men and women view love relationships differently and that love is sited in completely different places in the brain in the sexes.
- When you understand that your urges and feelings are controlled by chemical responses in the brain, you can learn to work with, rather than against them.