

Chapter: Emotions

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USING PSYCHOLOGY: Love and the theories of emotion

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INTERESTED IN MORE?

Emotions

WHAT'S THE ANSWER?

"Cindy, I just don't understand it. Sure, I love him. From all I can find out he's told half the basketball team -- and they've told all their friends -- that he likes me, too. You've told me. Rosey's told me. I mean, the message is pretty clear."

"So, what's the problem, Steph?" asks Cindy.

"Well, it just seems to go from bad to worse. I get so nervous when I'm around him. I mean, I've heard his voice shake a couple of times, and I know when we're alone he sometimes seems very shaky, really nervous, too. I so want to impress him. And the harder I try, the worse I do." *What is wrong here?*

Why do professional card-players always seem to wear dark glasses?

In a sympathetic manner, Chris says, "I was sorry to hear about your grandfather's death, Mort."

"Thanks," replies Mort. "My grandmother really took it hard. I guess you know it happened way back at the beginning of the summer. That's been four months and she's still really depressed. I think it's abnormal. She knew for a year he was going to die." Is it "abnormal"? *Is there another possible explanation for the long-term depression of Mort's grandmother?*

With an ear-piercing screech of tires, the brilliant blue Ford Taurus racing car seemed to lose traction just at the end of the sharpest curve on the 2.5 mile track. "When I came around the curve, I saw the wet streak on the track, but by then it was too late to do anything but steer for the softest spot in the hay bales beyond the track," said Theresa. "That wasn't the worst of it. Fred, riding shotgun, lost his lunch!" *Why -- in a motivational sense -- did Theresa's passenger get sick?*

An emotion is defined as a state of arousal and an attempt to label it. Our level of arousal directly affects how we behave. The arousal influences the efficiency of our behavior with moderate levels leading to most efficient behavior. Both low and high levels of arousal cause inefficient behavior. The study of emotions has included two approaches: studying and labeling photographs of posed facial emotions or analyzing the words we use in describing emotions. Arguments continue as to how many and what specific dimensions underlie emotional response.

Many theories of emotion have been developed, but three are typical. The Activation Theory assumes simply that our level of arousal is crucial to the emotion we experience. The Attribution Theory assumes that emotions result from the combined effects of our level of arousal and the interpretation we make of that arousal. The Opponent-Process Theory assumes that we try to keep our level of emotional arousal balanced.

Although we inherit a certain number of physiological motives, our emotions are entirely learned as we develop. We experience a broad variety of emotions, frustration being among the most common. It is generally thought that frustration does lead to aggression, but in some circumstances other responses may also occur. Stress occurs when we perceive that our well being is endangered, and we devote bodily resources to correcting the problem. The General Adaptation Syndrome suggests we proceed through three stages when stressed: alarm, resistance, and exhaustion.

Boredom is any state in which we seek higher levels of excitation than our current one. Many experiments have shown

the importance of varying stimulation to maintain our contact with our physical and social environment. Love is one of our most powerful emotions, yet it is a learned pattern of responses. Search for the brain control center(s) for love continues. Many psychologists do not expect a single or a limited number of control centers for "love" to be found.

What Is Emotion?

The kiss, the face turning red as beads of sweat form on the forehead, and the clenched fist all share at least one thing in common: Each is an outward sign of what is sometimes called inner turmoil or emotion. Unlike motivation, which we are able to define with some precision, emotion is a much more difficult term to narrow down.



We all know what it's like to feel emotion. Emotion is love and hate, anger and fear, pride and jealousy. It's things we like to do (such as be in love). Yet it's also things we don't like to do (such as be angry or afraid). Emotions sometimes create states within us that we'd do

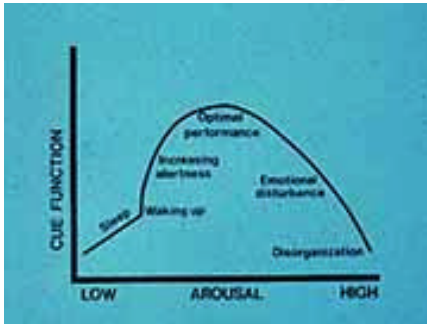
do anything to maintain. Other times they create negative feelings that fully occupy us until we can eliminate them. Since emotions are so very diverse, some psychologists wonder whether they share enough in common to be called the same thing.

Yet, all of these emotions -- and many others we could suggest -- share two things in common. First, they are motivational; they act just like the motives we discuss in the Motivations Chapter. And second, they are related to our level of arousal, as we show you at some length in this Emotions Chapter.

So, how are we to define the term emotion so that all these intellectual and motivational highs and lows will be encompassed in one concept? Let's try this: Emotion is a conscious experience involving participative (private) feelings, physiological arousal, expressive reactions, and observable activities related to the experience. Emotions play a large role in guiding all our behavior. Inherited inclinations, learning, and reasoning combine with motivated or emotional urges to control much of what we do and the efficiency with which we direct our behavior.

The Effects of Arousal

The accompanying illustration depicts Canadian psychologist Donald Hebb's ideas of the relationship between our level of arousal and the ability of that arousal to guide our behavior.



It's an important point to consider. Think for a moment about what happens when you experience an emotion, for instance, if you become fearful. Let's suppose you are afraid of snakes. We can follow your responses as you become more and more aroused.

First, if your level of arousal in all dimensions is low, you'll be sound asleep. That's like having all your needs fully met. On the motivational cycle, if you have just satisfied all your needs and avoided all threats, you'll probably go to sleep. But time marches on, and at some later point, when your total level of arousal begins to climb, you'll probably wake up. Maybe you'll be hungry, or thirsty, or cold. But if you're camping out and it's a fear of snakes you've got, a rustling in the leaves may be enough to awaken you. Now you're thinking about snakes, and that raises your level of arousal somewhat more. Then if you see a snake at some distance, you'll reach at least a moderate level of arousal. You'll be at your peak of efficiency in finding a stick to use as a weapon, climbing a tree to get away, or crossing a stream to put a barrier between yourself and the snake -- whatever it takes to protect yourself.

But then let's suppose that snake moves closer to you. Or perhaps hiking in the woods later that day, you come around a corner on the trail and there sunning itself on a rock is a large rattlesnake, now rapidly coiling and shaking its tail. Suddenly, as you are confronted by these signals only three feet ahead, your arousal is boosted to its highest levels. What is the effect on your behavior? You literally may be "paralyzed" with fear.

As we discuss in Stress it is thought that only about 15 percent of all humans show the correct behavior in dealing with such stressful situations. The middle 70 percent show varying degrees of disorganization. And from 10 to 25 percent (depending on the source of the arousal) may show totally inappropriate behavior. This can range from panic, to incorrect responses, to no response at all.

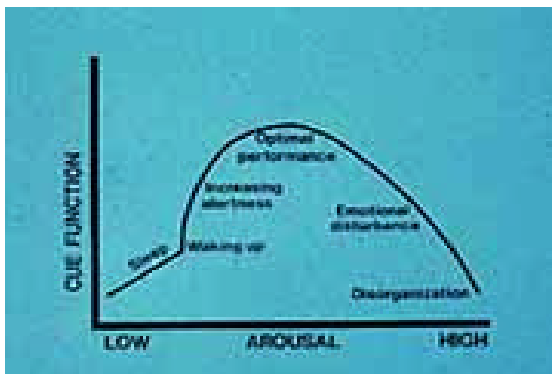
High levels of arousal can severely disrupt our behavior. For example, if you are deeply in love, you may find that your social interactions with the object of your affections are very

strained. You keep thinking that your behavior is very unlike the "normal" you, especially when you are with your friends and trying hard to impress him or her. Again, your problems represent the effects of being overstimulated, too aroused. The Think About It has additional details.

Think About It

The question: Stephanie has been trying to impress a new boyfriend, but every time they're alone both of them develop an extreme case of "nerves." What's happening here?

The answer: Football and basketball players practice so that at game time -- under conditions of extremely high pressure -- the complexities of their game have been simplified. The effect of high motivation on simple tasks is to improve performance, so (theoretically) the team does well. Not so with tasks of high complexity--where high motivation leads to very poor performance. That's the problem for Stephanie and her intended boyfriend. Both are highly motivated to make their relationship work, but the complexities of dating are leading to unintentionally poor performances by each of them.



Efficient behavior

Returning to the illustration, we find that very low or very high levels of arousal provide poor guidance for the situation at hand. With very low arousal the messages are too weak -- nothing occurs to you as a

response. With high arousal, the signals may be too strong -- meaning that there may be too many good responses right at your finger tips. "Watch it! There's a snake by your foot!!" What to do? Jump? Run? Stand very still? Hit it with the stick you're carrying? Look first to see whether it's poisonous? Scream? Spray it with insect repellent? If you start doing all of these things at once when highly emotional, it may confuse the snake, but it's not efficient. It does nothing to reduce your arousal.

And a related point, also important, should be mentioned here. We demonstrate in this chapter that as our level of arousal increases, our responses initially become more

efficient, but too much arousal leads to declining efficiency. However, notice that a moderate level of arousal causes us to be quite efficient in our behavior. In addition, the extent of disruption caused by comparable degrees of arousal may be very different for different emotions. Under some conditions -- for instance situations in which we are highly skilled -- we can tolerate a lot more arousal than others.

Dimensions of Emotions

When psychologists study emotions, they tend to focus on one of three things. These are (1) observable emotional behaviors (such as facial expressions or words), (2) arousal, and, most recently, (3) verbal labels or explanations attached to aroused (emotional) states.

Genuine emotions are difficult to elicit in the laboratory. You don't fall in love in a lab. You're unlikely to show jealousy or anger. Yet, we have made a lot of progress in the study of human emotions in the past 25 years. Let's examine two different research strategies that have proven very helpful.

Charles Darwin thought animals used facial expressions to communicate their intent -- such as whether they intended to attack or approach. He suggested that human expressions might serve essentially the same purpose. If so, it should be possible for humans to agree in their interpretations of facial expressions, our topic in Faces and Emotion.

Faces and Emotion

Our faces are always giving us away, especially in highly emotional situations. A "poker face" may be ideal for playing cards, but it's very difficult to achieve. A face is an extraordinary social stimulus. As we discuss in the Early Development Chapter, at some point in the development of infants the human face is preferred above all other stimuli. Harold Schlosberg had actors pose for pictures depicting a large variety of emotions. Then people were asked to sort the pictures according to a participant-generated scale -- from "a little" to "a lot" -- that included a number of emotions such as fear, anger, love, surprise, and so forth.



What were the results? Using these labels, people tended to sort the pictures into groupings that could be identified along one of three major dimensions. One was the pleasant-unpleasant dimension. This put love, mirth, and ecstasy at the pleasant end and anger and determination at the unpleasant end.

The second dimension that emerged, an acceptance-rejection dimension, was not quite as clear-cut. Surprise, fear, and suffering were at the acceptance or attention end and disgust and contempt at the rejection end.

The third was an activity dimension stretching from sleep to tension (arousal). This showed the importance of arousal, or level of activation, in identifying the emotion being posed.

Only one major concern about these studies could be raised: Would the same dimensions result if different photographs were sorted? Other studies have since confirmed the importance of the pleasant-unpleasant dimension. Yet, photographs in the acceptance-rejection dimension were sometimes identified as belonging to the arousal dimension. So we evaluate emotions good or bad, and at a certain level of arousal. This seems to be as far as posed photographs can take us.



In the early 60's Robert Plutchik tried to find out what would be experienced along a dimension of emotions that stretched from sleep to ecstasy, varying only the level of arousal. The emotion experienced was shown to differ as the participants' level of arousal changed. Results

indicated a series of emotions that started with sleep (no arousal). As arousal increased, the emotion changed from calmness, to serenity, then pleasure, happiness, and joy to ecstasy -- the most intense form of emotion on this dimension.

Our bodies actually reveal something about our momentary state of physiological arousal. Investigators have shown that as our interest in -- or fear of! -- something increases, so does the size of the pupils of our eyes. More interest, larger pupils. Check the Think About It.

Think About It

The question: Why do professional card players always seem to wear dark glasses?

The answer: "Professional" card players are usually playing cards to make a living, so winning is important. We've just seen that our face may often suggest what our internal emotional state is. Consider the pressure on card players when they are holding a very strong hand. First, their level of arousal will be high, so all their reactions will be emphasized. Second, they are eager to play any hand with strong cards, so they are probably at the extreme acceptance end of the acceptance-rejection dimension. Third, it's very pleasant or good to be in a high stakes card game with a good hand. So on the pleasant-unpleasant dimension, again, the lucky cardholder is at an extreme.

In sum, with a good hand a professional card player is under high arousal, at the extreme end of the acceptance and the pleasant dimensions. All factors would combine to make such emotions easy to "read" in his or her eyes so a card player does everything possible to hide those signs from careful observers.

Table 1 summarizes the most fundamental emotions that appear in a wide variety of theories of emotions.

Table 1

*The Language of Emotions:
Internal, Behavioral, and Functional*

INTERNAL FEELINGS	OBSERVED BEHAVIOR	FUNCTION OF EMOTION
Fear, terror	Withdrawing, escape	Protection
Anger, rage	Attacking	Destruction
Joy, ecstasy	Mating, possessing	Reproduction
Sadness, grief	Losing contact	Deprivation
Acceptance, greed	Eating	Incorporation
Disgust, loathing	Vomiting, defecating	Rejection
Expectancy, watchfulness		Sensing
	Exploration	
Surprise, astonishment	Stopping	Orientation

Can you think of any emotional experience that you've had that would not fit under one of the emotions listed there?

Words and Emotion

How do we speak about our own emotions? A second attempt to label the dimensions of emotion simply studied our language. Interviews were used, and people were asked to write their own definitions of words identifying emotions. More than 550 items were identified. In defining or analyzing certain types of emotions, people tended to use the same cluster of words or phrases. It seems safe to assume that if many of the same words are used to define or describe several emotions, then these emotions are probably related. Thus, a large list of 50 emotions was condensed into four dimensions: hedonic tone (goodness-badness), relatedness, activation, and competence. Note that these are similar to the three dimensions based on the study of photographs of posed emotions. Table 2 compares the results of the two studies.

Table 2

Comparing Underlying Dimensions of Emotion

BASIC DIMENSION BEING TAPPED	DIMENSIONS OF EMOTION SUGGESTED FROM THE STUDY OF	
	PHOTOGRAPHS	WORDS
LIKE OR DISLIKE	pleasant-unpleasant	Hedonic tone
APPROACH OR AVOID	accept-reject Relatedness	
LEVEL OR AROUSAL	sleep-arousal Activation	
	Competence	

We don't yet know exactly what to conclude. However, it does point out that there are some basic dimensions underlying our emotions -- our discussions, experiences, and views of them. The most consistently reported dimension of humans' emotional experience seems to be the evaluation dimension -- good or bad, pleasant or unpleasant -- used to label the emotion. A second widely demonstrated dimension has to do with the level of arousal associated with an emotion. A third dimension concerns the degree of relatedness -- approach or avoidance -- a person

chooses to demonstrate with respect to the object of various emotions.

Theories of emotion

Theories and facts sometimes don't seem to agree too well. Notice, as you read, that analyzing how we talk about emotion suggests a very different set of organizing principles than some of the theories which follow.

The earliest attempts to create a theory of emotions were actually two different attempts by two individuals in two different countries two years apart -- neither apparently aware of the work of the other. The collective works were later combined into the James-Lange Theory of Emotion. James and Lange argue that an emotional experience is composed of four events: (1) you notice a situation -- there's a man with a gun, (2) you react to your observation -- you put your hands in the air, (3) you notice your reaction -- my hands are in the air, and that leads to (4) an emotion summarizing what you noticed, your response -- I must be scared.

Some years later Walter Cannon (1927) and Philip Bard (1934) proposed a theory of emotions reflecting psychology's growing interest in the physiological processes underlying human (and animal) behavior. The Cannon-Bard theory of emotion suggested that (1) we detect what will be an emotion-arousing event through any of our senses -- whether vision, or touch, etc. (2) That detection is relayed to the thalamus -- viewed at the time as the "seat" of emotions -- where the signal is split. (3) One signal is sent to the cortex. (4) Another signal causes whatever is the appropriate bodily reaction. (5) The sensors within the body detect the body's reaction and relay information regarding that reaction to the cortex, where (6) the newly arriving information combines with the original signal (#3 above) to yield the appropriate emotional experience.

These earliest theories were sophisticated for their time, but gave only a hint of work starting at mid-century which leads to our modern theories of emotion. We discuss three -- one developed in the 50's, one in the 60's, and one in the 70's. One theory of emotion concerns physiology, another thinking, and the third internal processes of which we may not even be aware. Are they really addressing the same set of behaviors? Yes, they are. Since emotions are very complex, you are driven to react in many different ways. And a lot of things are going on inside you at the same time. These theories are not mutually exclusive, but they attack the complex issues of emotions from very different angles.

We know that various parts of our nervous system and glands are active when we're experiencing an emotion (Activation Theory). We also know the cortex is active in emotional reactions. From this we can account for the "thinking" portion of emotional experiences identified by the Attribution Theory. Finally, we can combine the physiological and thinking activities with the idea of homeostasis -- the need of the body to return the system to some kind of operating middle ground. Hence, the Opponent-Process Theory.

Activation

Remember our definition of emotion as a state of arousal and the way in which we interpret or label it. The first modern theory, called the Activation Theory of Emotion, stresses that arousal underlies emotion; more arousal means more emotion, but that rather simple idea is based on a variety of observations -- some confirmed, some now disputed.

When we are emotionally aroused, our EEG brain waves (check the Physiological Processes Chapter to review the EEG) show a certain loss of regularity. This irregular EEG pattern of arousal can be produced by stimulating or removing the portions of our central and autonomic nervous systems that help arouse or calm us.



Indeed, one of the most startling discoveries came from early studies of electrical stimulation of the brain. What James Olds discovered was a pleasure center in the brains of rats. For electrical stimulation in the limbic system, hungry rats would ignore food just to press a bar in a Skinner box as many as 5,000 times per hour. Other research found that other parts of the limbic system and hypothalamus are involved in such diverse emotions as aggression and fear.

Advocates of this Activation Theory suggest that emotions are expressed in three ways. First, they are expressed through cortical activity such as thought, worry, or anxiety. Second, they're expressed through body activities such as sweating or crying -- actions controlled by the autonomic nervous system. Finally, emotions are also expressed through facial expressions and muscle tension.

Thus, one mode of expressing emotion involves cortical arousal, a second involves brain-stem arousal, and a third involves body motor arousal. The tie between emotion and physiology seems fairly tight. This activation theory places heavy emphasis on physiological activities. However, it doesn't spend much time discussing the "thinking" or "feeling" parts of emotion. That is corrected in a later theory proposed in the 70's -- Attribution Theory.

Attribution

In his Attribution Theory, Stanley Schachter asserts that our emotions result from the joint impact of our level of arousal and the interpretation we make of an existing situation. More recently, others have added the idea that to experience an emotion, we must also make a causal link between the arousal and the label we give it.

In the Motivations Chapter we mention that our body's physiological reaction to arousal -- be it loving or lying, fearing or fighting -- is essentially the same. We name our response (that is, our emotion) by means of information we pick up from our environment. Thus, a given level of arousal may be labeled anger or love or any of the other emotions, based on what we think caused the arousal in the first place.

For instance, what would you predict would happen if you were physiologically aroused but could not explain why? If this theory is correct, you should look for cues from your environment. Thus, as we change the environment (the cues), we ought to be able to change the "emotion" you will report you are experiencing. Feature 1 gives the results of a study that did just that.

Feature 1

NO LAUGHING MATTER

Four groups of participants were invited to receive an injection of a new vitamin substance that was supposed to improve eyesight. Called Suproxin, the substance was actually adrenaline, which is a stimulant. Adrenaline was given to the three experimental groups. As a consequence, their level of arousal was increased. The control group received an injection of a neutral saline solution.

Next, one group of participants was fully informed as to what to expect from the injection (increased heart beat, feeling warm, and so forth). Group two was misinformed (expect a headache, and general numbness). A third experimental group was told nothing: they remained ignorant. The control group was told nothing, but their injection would not have caused anything noticeable to happen anyway. All participants were assigned to one of two experimental conditions and then required to wait "for the Suproxin to take effect." While waiting each person was asked to fill out a very personal, questionnaire which started with very innocuous questions that became increasingly insulting as participants proceeded through it.

Also filling out the questionnaire with each person was a confederate (or "stooge") of the experimenters who pretended to do one of two things (the second independent variable): become angry, or become very euphoric (joyous). In the first case the confederate simply got madder and madder at the "insulting" questionnaire. Finally he wadded up the questionnaire, stuffed it violently into the wastebasket, and left the room. With members of the other group the confederate merely laughed at the more and more insulting questions. Making an airplane of the questionnaire and cracking jokes, he finally "sank" the questionnaire as a basketball into the wastebasket, and left the room. Notice that the actual actions were similar for both confederates, but in one case the questionnaire led to euphoria, in the other, anger.

Finally, all participants were told that since their "mood" might also affect their vision, they should now rate their anger and happiness before completing their vision test. At this point the experiment was finished.

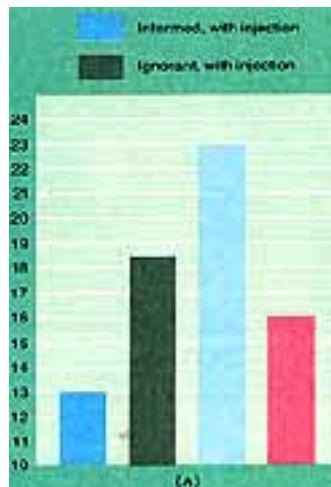


Figure (A) shows the results for the Informed, the

Misinformed, the Ignorant, and the Control subjects who had waited with the "euphoric" confederate. The Informed participants had expected the physical sensations they experienced, and they were least influenced by the cues from their environment (the mood and actions of the stooge). The Control group participants (receiving no

adrenaline) were slightly more influenced. The Ignorant, getting the adrenaline but no explanation, were even more influenced. The Misinformed (expecting numbness) were the most influenced.

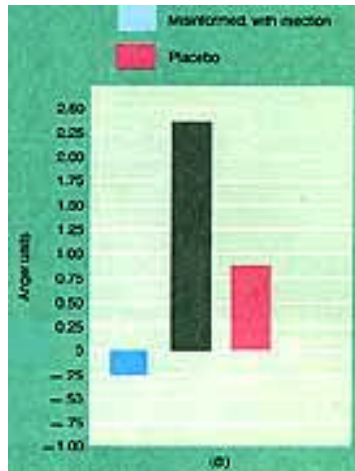


Figure (B) shows the performance of the three groups in the anger condition. The participants in the Informed group were not influenced at all by the stooge. The Control group was slightly affected. However, the Ignorant participants were clearly affected and became much more angry. Those participants in the Ignorant and Misinformed groups could all be described

as experiencing a state of arousal in search of an explanation. Attribution Theory strikes again.

Or consider another possibility. If someone is aroused, but has a good explanation for it, is he or she likely to be convinced by any other version or explanation? That is, is the person likely to accept any more cues from the environment? It's not likely. And what if you merely experience the same thought from time to time? Will you always experience it as an emotion? No, you won't. If the theory is right, you'd only call it an emotion if you were also aroused when the thought occurred and you linked the thought to the arousal.

These possibilities point to one of the functions of theories in psychology. They organize data, and they generate predictions by which the theory can be tested. And tested it is.

Opponent-process

A third attempt to develop a theoretical explanation for emotions tackled the issue by returning to one of the most basic processes of motivation -- homeostasis. This Opponent Process Theory is based on three assumptions. First, being head over teacup in love is a very disabling experience. Great fun, it still makes it difficult to get things done. This theory is based on the assumption that we try to keep our arousal at a

moderate level. We strive to keep it tolerable, and rather constant -- kind of an emotional neutral.

Second, the theory assumes that any change in our level of arousal will -- with repeated stimulation -- lead to the development of an internal opposing process. That internal process will eventually counteract the effects of the external stimulation in order to return the experienced level of arousal to a tolerable level.

Third, since arousal may increase or decrease, it follows that the opposing process can either decrease or increase.

Now this leads to a couple of rather interesting predictions. For example, if we can remove from your environment whatever it is that caused you to become aroused, then that should change how you perceive the environment. The theory also implies that your emotional experiences will change over time. Why? Because the opponent process will -- through repeated classical conditioning experience -- also change over time as summarized in the Figure.

So what? Well, let's take the matter of love. When you first fall "madly" in love, several things happen: (1) You can't concentrate on anything else. (2) In idle moments you find yourself thinking about him or her. (3) You'll go out of your way to "accidentally" run into that person. (4) You'll arrange to spend as much time as possible with or near him or her. And so forth. But if the Opponent-Process Theory is correct, then as soon as Mr. or Miss Perfect walks into your emotional life, an opposing internal process is started to bring you back to ground level, to calm you down, to bring your arousal level back to a moderate level.

But let's go one step further. Suppose your Mr. or Miss Perfect leaves campus the morning after meeting you. You learn through mutual friends that he/she is attending an out-of-state university and dating the class president there. Removing this arousing stimulus from your environment will temporarily expose you to the impact of the second, developing internal, negative state.

Check in the Faces and Emotions section of this chapter and you'll see that loneliness is the emotion often located directly across from (or opposite) love. However, although your love may have been very intense, it only existed for a very short period of time. So the rebound or negative feelings of loneliness you have are relatively mild. Yes, you've lost Mr. or Miss Perfect, but you recover fairly rapidly. Because the positive stimulus is gone, there is no longer a need for the internal, negative force to bring you back to a neutral level of arousal. As the developing internal negative experience wears off, you return to neutral. The next day you're back partying again.

But let's suppose a different state of affairs. Let's assume that you and Mr. or Miss Perfect hit it off beautifully - you are the chosen parties for each other. Marriage follows, then children, and finally middle age.

Take a moment here to note that it is very difficult both to be intensely in love and still continue to do the normal chores of life. Your mind is constantly wandering. Your work efficiency drops, and you waste incredible hours just thinking of your loved one. Over time the internal process operates to bring you back to reality -- back to a more balanced or moderate level of stimulation so you can respond to other cues.

You and your mate eventually retire, and after many happy years, your Mr. or Miss Perfect of years gone by dies. Remember the intense feelings back when you first met? They have dwindled gradually because of the steady, slow development of a negative, internal state. Now suddenly, your beloved is gone. What will be the result? Read the Think About It.

Think About It

The question: In the opener to this chapter Mort was expressing surprise that his grandmother was still depressed four months after the death of her husband. He labeled her response "abnormal." Are there any other explanations?

The answer: Clearly, in terms of the Opponent-Process Theory, there is another answer. Even though Mort's grandmother might have had a year to prepare herself for her husband's death, that forewarning might actually have made matters worse.

Suppose his grandparents cared very deeply for each other. They probably had built up strong internal responses to keep their emotions at a moderate level when they were together. During the last year of care and caring Mort's grandparents may well have spent even more time with one another than usual. As a result the internal processes keeping them individually emotionally balanced had a lengthy time to stabilize at a high level. Once Mort's grandfather passed on, his wife was now faced with his absence. But she also now had to readjust tremendous internally generated negative feelings -- made all the more intense by the last year of illness during which the partners spent so much time together.

The Development of Emotions

Anger may drive us into attacking someone. Fear makes us seek to run away. Love causes us to approach someone. Yet, at birth infants are not able to express emotions in our adult sense. Are our emotions inherited? Mostly likely no. Some of

the components involving the physiological and bodily responses to emotion are inherited, but not the emotions themselves. They're learned. And they develop from the very simple array of human capabilities with which we arrive on this earth.

One of the classic descriptive studies in developmental psychology was done in the early 1930s. It traced identifiable emotions in human infants as they developed. During the first month or so of life an infant has very few response capabilities. He or she can be quiet or scream. Yet even by the age of three months these early vocal offerings will often cue parents as to what the problem is. Distress -- hunger or a wet diaper -- yields a distinct cry as compared with that identifying other needs. And soon thereafter the child is cooing when all is well. It is interesting that as infants develop they learn more negative than positive responses. And these they learn more rapidly than they learn positive, other-oriented responses. It is as if humans are concerned with no one but themselves in the first few months. Only during the latter portion of the first year do social and other-oriented responses such as affection begin to emerge.

We're too rich in the emotions we develop -- love and hate, fear and aggression, boredom and joy, depression and anxiety -- to discuss all of them. In this section we take just a sample of them and study in more detail what they involve, including frustration, stress, boredom and love.

Frustration

One of the earliest emotions we encounter as we develop is frustration. From where does it come? You have just enrolled in a judo class that meets Mondays and Wednesdays from five to seven. You've paid your good money for ten weeks of instruction and here you sit in a traffic jam -- half a mile from class, ten minutes late, and counting. So the environment has created a frustration. By now you are probably showing a number of internal symptoms. The motorists around you are glaring at you because of the way you're trying to push your way through traffic. They would agree that you are behaving as if frustrated. All the conditions are present: The environment is creating a blockage to your progress -- an independent variable -- toward a desired goal. You are reacting internally -- the intervening variable. And your behavior -- the dependent variable -- indicates your internal state.

The responses to frustration may cover quite a range of possibilities. One response is often anger and aggression. In fact, the frustration-aggression hypothesis was suggested many

years ago: Frustration -- it was thought -- leads to aggression. One "cruel" but very well-known experiment was conducted back in the late 1930s to test this hypothesis.



A number of preschool children were allowed time to play with an average set of toys -- nothing outstanding, just nice toys. The constructiveness of their play was rated. Then they were given 15 minutes to play with a brand new set of the best toys available.

And then -- from the children's point of view -- tragedy struck. The experimenters asked the children to return to the original average toys. They were now allowed to play only with these, even though they could see through a window the brand new toys unused. As you might suspect, there was a marked decline in the constructiveness of the children's play. In short, frustration led to aggression.

More recently it was pointed out that there is a major confounding variable in this classic experiment. Think about it a minute. Children playing with toys gradually exhibit less productive forms of play? What happens to the quality of their activity any time children do anything for an extended period of time? They get tired or bored, and the quality of their play declines. So time was a confounding variable -- its passage might have accounted for some of the observed frustration. A more modest interpretation is that frustration may lead to aggression, but other responses may also result.

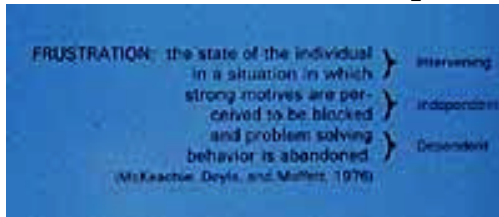


What are these other responses? One of them is fear or anxiety. It may be fear of punishment or the loss of a desired goal object -- whether that be food or judo lessons. . . Frustration may also lead to withdrawal or apathy, although sometimes that is not available

to us as an option. Are you frustrated by the fact that your grades are lower than you know you're capable of earning? One solution is to work harder, but if the frustration becomes too much, another (less desirable) solution is available. You could lower your level of aspiration, but that really amounts to withdrawal. Still another response may be physical stress.

Since stress, and our reaction to it, can be so complex, we discuss that separately.

We all have to deal with frustrations all the time. How do we handle them? It becomes one measure of our total personal adjustment, as we discuss in the Personality: Mental and Behavioral Disorders Chapter.



Our frustration tolerance level is the degree of hindrance or threat that we can endure without resorting to deviant or inappropriate modes of responding. to deviant or

inappropriate modes of responding. We examine that in more detail, as we look at another emotional problem with which we sometimes must deal -- stress.

Stress

From where does it come? Stress differs from frustration in that it has much less of a social orientation. We most often experience stress in our usual environment. As you develop, your first experience with stress -- if you're lucky -- may not occur until late adolescence or young adulthood. More extreme than most motivations, it threatens our ability to continue to function normally. However, we must perceive the threat and be unable to handle it before stress will be registered. Thus, we define stress as our state when we perceive that our well being is endangered. When this occurs, we must devote all our energies to protecting ourselves and restoring a sense of well being.

Are there examples of stress in your everyday life? Perhaps not. But, there are studies of humans' reactions to the continuing stress in a situation such as war. A study was conducted of more than 2,000 infantry men who fought in the Pacific during World War II. They were asked the question listed at the top of Table 3.

Table 3

*Reported "Emotional" Responses of
Combat Troops While Under Fire*

During World War II 2,095 infantrymen fighting in the Pacific were asked the following question: "Soldiers who

have been under fire report different physical reactions to the dangers of battle. Some of these physical reactions are in the following list. How often have you had these reactions when you were under fire?"

PERCENT OF MEN

REPORTING THE RESPONSE

SYMPTOM

84	Violent pounding of the heart
69	Sinking feeling to the stomach
61	Shaking or trembling all over
56	Cold sweat
55	Feeling sick at the stomach
49	Feeling of weakness or feeling faint
45	Feeling of stiffness
27	Vomiting

Compare the percentage of soldiers who report each of the symptoms listed there with the statements we make early in The Effects of Arousal section of this chapter about the percentage of people who respond inappropriately.



In fact, any time our body is stressed, it mobilizes its resources. One of the best analyses of how our body reacts to defend itself was conducted back in the late 40's. What was proposed was the General Adaptation Syndrome. It was suggested that when we

perceive a stress, we go through three stages of reaction. The first is the alarm, or "oh my gosh," stage. Its first part is the shock itself when damage is experienced -- be it a cut, a broken bone, a threat, whatever. Its second part is the

countershock. Here the body resources are called into action. The sympathetic nervous system pumps body resources into the affected area, and the body prepares for resistance. Faced with such stressors a wide variety of body responses may be experienced as detailed in the Think About It and the Table.

Think About It

The question: A skilled driver and her passenger were in a car that rolled over, apparently in a situation that permitted the driver to use skill to minimize personal risk and injury. In describing the accident afterward she related that her passenger got sick to his stomach as a result of the accident. Why -- in a motivational sense -- did her passenger get sick?

The answer: There is research available -- even with chimpanzees -- to suggest that being in control of a situation is much less stressful than being in a position where control is entirely in the hands of another person. Here, though he had a driver who was very skilled, the passenger recognized that he couldn't do anything to prevent or control the coming accident even if he wanted to. His stress was high. As seen in Table 11.3, while under stress he "emitted" one of the less desirable -- but nonetheless predictable -- responses.

If the stress continues, the second phase or stage, called resistance, occurs. The first reactions of our body that were started during the countershock stage are continued. In effect, our body is attempting to restore an appropriate level of stimulation by correcting whatever problem has developed. The more serious the problem, the more body resources will be involved in trying to correct it. Temperature may go up, but blood pressure tends to return to almost normal. To the casual observer -- not aware of the injury or stress to which you're reacting -- your functions and color may seem almost normal.

Finally, if the various resistances your body has offered can correct the problem, normal operation is restored. You get over the cold, the wound heals itself, or the broken bone is mended. But, if the stress continues too long, or if it is too severe, then your body gradually moves into the third stage, exhaustion, as the body's resources are used up. As a result, many of the reactions seen when the stress first occurred may be seen once again.

Once exhausted, what happens if any additional stressors are encountered? Your body may be able to register alarm and perhaps marshal some resistance, but, since reserves are so low, exhaustion may come much more rapidly. The final result is a collapse of the defenses, and death is very likely to follow.

Boredom

One of the "dangers" as we develop and live is that we will become bored. From where does it come? Many of the examples cited in this chapter involve what happens when we get too much stimulation. We all enjoy moments of quiet, however. We seem to like to get away from the rush of life to dream or daydream - - essentially to regain a fresh view of the world and some sense that we control -- or, at least, can influence -- it.

But therein lies an interesting question. We've talked about too much stimulation. If the concept of homeostasis -- maintaining a balance -- is correct, what happens if we find ourselves experiencing too little stimulation? Solitary confinement, involving limited visual and auditory stimulation, no social contact, and a barren environment, is considered a very severe punishment. Why is this so? Examine the illustrations for some interesting studies conducted on boredom.

What do we learn from the experiments? That our intellectual development depends on experiencing a normal range of varying events -- visual and intellectual. Research seems to demonstrate quite well that we require these stimuli during maturation and development. In addition, we need a diverse world of experiences in order to maintain our own self-concept. It helps us to perceive accurately the world of which we are a part, and to maintain our normal social and personal skills.

If a lecture turns boring, what do we do? We tap our fingers or wiggle in our seat -- anything to keep ourselves stimulated. If we lose track of or interest in a conversation at a party, what do we do? We start looking around for someone else with whom to talk. We are constantly seeking a variety of stimulation. Perhaps amusement park rides push our search to the limits, but in one sense they exist because of our desire for excitement and change.

Love

Let's return to a subject we discuss in the Later Development: Adolescence to Old Age Chapter -- love. It's an emotion, of course, and one of the most intense that we may experience. But why does it exist? From where does it come? What causes it? What benefits come from it? These are not easy questions, and over the past 30 years love has become the object of focused study by psychologists. The findings are

illuminating, especially as we examine love in the context of the modern theories of emotion.

First, you will remember we suggested love between two adult humans involves three things -- attachment, caring, and intimacy. Think about the Attribution Theory. It gives you hints on some of the factors influencing all emotions, including love. Two elements are essential -- arousal and mental labeling. But where did it all start? In your mother's lap -- literally. A newborn infant is not very beautiful by "baby contest" standards. The attachment and accompanying love grows gradually. However, this early love grows with time -- consistent with the Opponent-Process Theory. It has been demonstrated that a major factor in establishing affection and love between mother and child is physical contact. At least in the child's eyes, a mother who supplies comfort is very important. From the rubbing and stroking, the rocking and nursing that are so much a part of the feeding process, grows the emotion we call love.

We can define love simply as feelings of affection for another. The infant's love for its mother is the first such feeling to develop and express itself in humans (see Feature 11.2). This is followed later (some psychologists say) by peer, or age-mate love. Peer love is the first to exist outside the family. It often finds its first expression in the choosing of a preferred or favorite playmate. When we were first let out of the house, this playmate for each of us was just as likely to be male as female -- sex really didn't matter. In the later years of childhood, the playmate is very likely to be of our own sex and general age. Play, as discussed in the Early Development Chapter, is a very important part of this love.

Usually in adolescence, however, the first example of heterosexual, other-directed love develops. This is romantic love, which often accompanies the human sexual drive. Romantic love is a powerful motivational force for humans, even capable of overriding the purely motivational drives of sex. It seems our literature teems with love scenes, yet the objective study of love has begun to emerge only in the past couple of decades. One major problem was simply providing an operational definition of love -- a problem we face over and over again in the study of all emotions.

Feature 2

IRON MOMS AND OTHER PROBLEMS IN LIVING

Mothers usually seem to be such reliable figures. When we arrive on this earth Mother is already there. She gives us food, warmth, and protection. She coos at us, cleans up our every mess, and always seems to be around when something goes wrong. These facts lead to an interesting question. What causes infants to begin to love their mothers? That is, is "infant love" -- the first identifiable human love -- innate or learned? Will it occur anyway, or do we learn to love?



Some possible answers were provided by Harry Harlow's classic studies of infant-mother love, conducted using monkeys during the 50's. The illustration shows the basic apparatus.

One of the first and simplest problems was whether food or creature comforts was more important. After all, we do spend more time sleeping than eating. In one of the very first studies, infant monkeys were isolated just after birth. They were placed in a cage with two kinds of "mothers." The hard-iron mom was made of welded wire. The other "substitute" mom was covered with terry cloth toweling. That was one independent variable.

The other independent variable involved which mother gave milk. In various conditions of the experiment, some monkeys were placed with a milk-giving cloth mother and a non-milk-giving wire mother. Others had a milk-giving wire mother and a non-milk-giving cloth mother.

Note the results. When the monkeys were forced to make an either-or choice, the wire mothers received only about 10 percent as much attention as the comfortable cloth mothers, even if the wire mother gave the milk. Clearly, physical comfort was more important than milk.

Some of the traditional theories about love for our mother growing out of the sight of her face as we're feeding clearly didn't do too well. As one psychologist put it, such explanations of infant-mother love will have to ". . . be fashioned from whole cloth rather than whole milk"! Such love, then, is learned; it is not inherited.

Heterosexual love, as we said, usually emerges at puberty. The practice of dating allows a refinement of the skills involved in such love. Romantic love often reaches its fullest

expression by late adolescence. It continues to function through most of adulthood and the elder years.

Several factors are important to the full development of our skills in heterosexual love. One of these is trust. A second is the acceptance of heterosexual contact. It's a big step socially and mentally to move from the secure years of late childhood into the adolescent years. As a child we often had the support of a same-sex playmate and the warmth of a home, but in early adolescence more time must be spent outside the home. As this period continues, young men and women gain additional skills in relating to the opposite sex. Differences in roles help to contribute to developing heterosexual love. Finally, an often overlooked, but very important factor is the social motivation for physical proximity -- that intimacy of which we speak.

USING PSYCHOLOGY:

Love and the theories of emotion

Is there any way you can apply the theories of emotion to your own life and loves? Well, if emotional experiences are based on a blend of arousal and labeling, then one of the functions of dating is to permit time for the arousal to occur. Dating can provide opportunities to identify and share mutual interests. As fear recedes and common interests are found, the number of shared activities may increase. Certainly the labeling of what you feel as you do things together may be love (Attribution Theory).

If a love is to grow between two individuals, it would seem that the intensity of that love would grow with increasing levels of arousal -- higher arousal yielding a greater or more rapidly developed love. Some examples suggest themselves. One is to note a common experience of adolescents who go to summer camp. They meet a young man or young woman with whom they fall in love. Summer camps emphasize activity -- horseback riding, swimming, hiking . . . you name it. So if the activity level is high and love does develop between a young man and woman, it follows such a love might have developed more rapidly because of the arousal resulting from the physical activity. Another possibility is that the feelings under such conditions will be more intense. The social and physical qualities of the "loved other" will be exaggerated and idealized beyond what careful examination will bear.

Using this hypothesis (and focusing on Attribution Theory), what can you do if you are madly in love with someone, but haven't managed to catch his or her eye? Why not try suggesting

some activity that will involve physical exertion -- skiing or skating, biking or hiking? Run the arousal level up, and if nothing develops . . . go back to studying psychology!

The statistics are overwhelming that regardless of how discouraged you may be about ever meeting someone you can truly love, it will happen. Being prepared for it, being aware of the things -- psychologically, motivationally, and interpersonally - - that affect the process is perhaps the only "assistance" you need.

One other set of observations of which to be aware may surprise you. We don't yet know where love comes from. We've identified sites controlling hunger and thirst, and all sorts of sensory and motor activities in the brain. We even know where many of the physiological aspects of sex are monitored and controlled in the brain and spinal cord. But we have not located such things as human will. Nor, for that matter, are we even sure we'll be able to find where "love" is located. Perhaps love will to some degree always remain the "great mystery."

REVIEW QUESTIONS

WHAT IS EMOTION?

1. What happens to the efficiency of behavior as the level of arousal increases? Provide an example.
2. What is emotion?
3. Give examples of an emotion as (a) an independent variable, (b) an intervening variable, and (c) a dependent variable.

DIMENSIONS OF EMOTION

1. Describe two approaches used in studying emotions. What are the findings yielded by each approach?
2. What are the usual "dimensions of emotion"? Provide an illustration for each one.

THEORIES OF EMOTION

1. Compare and contrast three major modern theories of emotion. On what points do these differing theories agree?

THE DEVELOPMENT OF EMOTIONS

1. Are emotions inherited or learned? Support your answer.
2. Choose an emotion experienced by two-year-olds and list the differentiated feelings that proceed from it during childhood.

3. What are some possible results if you become frustrated?
4. What is "frustration tolerance"? Give an example of it.
5. What is stress and how does your body react to it?
6. Identify the three stages of the General Adaptation Syndrome.
7. What is boredom and what causes it?
8. Is love an inherited or learned emotion? Describe three different types of love. Is there a brain center for love?

ACTIVITIES

1. Does your family have a large collection of old photographs? If so, go through them and see whether you can sort them into three stacks representing the pleasantness-unpleasantness dimension, the acceptance-rejection dimension, and the passive (sleep) to active (arousal) dimension. Alternatively, you might find it easier to use photographs from a magazine. Whichever source you choose, after you've sorted your photographs, mix them up again and ask a couple of friends to sort them. Do they agree with your classifications?

2. To appreciate the extent to which words can influence emotion, research the speeches of leaders in World War II. Compare the words of a dictator, such as Hitler or Mussolini, with the words chosen by a democratic leader such as Mackenzie King of Canada, Franklin D. Roosevelt, or Winston Churchill. What differences do you find? What motives is each leader appealing to in his people?

3. The text uses falling in love and being in love to illustrate the Opponent-Process Theory. Pick an emotion-packed activity with which you are familiar, and give an Opponent-Process explanation for the emotions you experience during the activity. Or interview someone with a potentially dangerous hobby such as sky diving, or a dangerous occupation, such as deep-sea diving or washing windows on high-rise buildings. See whether you can detect in this person the same shifting emotional experiences over time: Can they recall their emotions early in that dangerous activity? How does it compare with their current emotions in view of their increased experience?

4. What kinds of environmental events are frustrating to you? How do you behave when you are frustrated? In terms of the various theories of emotion, describe some ways in which you might reduce your frustration without giving up your goals.

5. Teenagers report that they tend to fall in love during summer camp, and that their feelings tend to be more intense than love experienced during a regular school year. Which of the three theories of emotion offers the best explanation for this? Using your chosen theory, develop an explanation for this phenomenon.

6. Marriage counselors are trained to advise couples whose marriages are causing them emotional problems. Time permitting, interview a marriage counselor. Ask him or her to describe the methods used in trying to improve deteriorating marital relationships.

INTERESTED IN MORE?

Candland, D. K., et al. (1977). *Emotion*. Pacific Heights, CA: Brooks/Cole. Tough reading, but this series of papers reviews at some depth the environmental influences on emotion.

Darwin, C. (1972). *The Expression of Emotions in Man and Animals*. Chicago, IL: University of Chicago Press. One of the original detailed studies of the behaviors, facial expressions, stances, and postures by which humans and animals communicate emotions.

Dollard, J., et al. (1939). *Frustration and Aggression*. New Haven, CN: Yale University Press. The original study of the relationships between environmental events indicating success or failure and the behavior that follows the events. Heavy emphasis on learning rather than inherited behaviors.

Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). *Emotion in the Human Face: Guidelines for Research and An Integration of the Findings*. New York, NY: Pergamon Press. One of the most up-to-date programs of research emphasizing inherited causes of human emotional behavior.

Izard, C. E. (1977). *Human Emotions*. New York, NY: Plenum Publishers. Reviews a wide array of human emotions from fear to love. Includes related research strategies and important theories.

Jacobson, E. (1967). *Biology of Emotions*. Charles C Thomas. Offers a very different analysis of emotions than that

offered by Dollard and his colleagues in their study.
Emphasizes inherited, physiological factors influencing human emotions

Nebraska Symposium on Motivation. University of Nebraska Press. A yearly collection of six to eight research papers on a wide variety of motivational and emotional topics. Very tough reading, but sometimes has extremely good critical summaries of an area of observation and research.

Plutchik, R. (1980). *Emotion: A Psychoevolutionary Synthesis*. New York, NY: Harper & Row. Not the lightest reading in the world, nonetheless this text offers a good description and analysis of a wide variety of theories of emotion.