Chapter

VI

EMOTION AND MOTIVATION

This section deals with our inner experiences of emotion and motivation. Many nonpsychologists have trouble with the idea of researching these issues scientifically. A popular belief contends that our emotions and motivations just *happen,* that we don't have much control over them, and that they are part of our standard equipment from birth. However, psychologists have always been fascinated with the issues of where your emotions come from and how your feelings cause you to act as you do. Emotion and motivation are basic and powerful influences on behavior, and a great deal of research allows us to understand them better.

The first study in this section may surprise you in that it focuses on the sexual response studies begun by the famous research team of Masters and Johnson in the 1960s. It is included here because human sexual feelings and behaviors are strongly influenced by our emotions, which can also serve as powerful motivational forces. The second reading examines a famous and fascinating study about facial expressions of emotions and demonstrates that our facial expressions for basic emotions are the same for everyone in all cultures throughout the world. The third study in this section presents research about how *extreme* emotions, those that create stress, can affect your health. The fourth reading allows you to experience the process of one of the most, if not the most, famous experiments in the area of motivation: the original demonstration of a psychological event called *cognitive dissonance.*

Reading 21: A SEXUAL MOTIVATION . . .

Masters, W. H., & Johnson, V. E. (1966). *Human sexual response.* Boston: Little, Brown.

You may not immediately realize this, but human sexuality is very psychological. Many people might logically place the study of sexual behavior into the disciplines of biology or physiology, and it is true that these sciences certainly

CONCLUSION

You can see that personal power and control not only affect your happiness, but they also can make you healthier. You can easily apply Langer and Rodin's ideas to your own life. Think for a moment about events, settings, and experiences in which you were allowed very little personal control over your behavior; the situation "forced" you to behave in specific ways. You probably remember those experiences as more uncomfortable, more unpleasant, and significantly less enjoyable than events where you could freely choose what to do and how to act. In most of life's situations, increasing your degree of behavioral choices, and those of others', is a goal clearly worth pursuing.

Glass, C., & Singer, J. (1972). *Urban stress: Experiments on noise and social stressors.* New York: Academic Press.

Iyengar, S., & Lepper, M. (2000). When choice is demotivating: Can one desire too much of a good thing? *Journal of Personality and Social Psychology, 79,* 995–1006.

Krampe, H., Hautzinger, M., Ehrenreich, H., & Kroner-Herwig, B. (2003). Depression among elderly living in senior citizen homes: Investigation of a multifactorial model of depression. *Zeitschrift fur klinische psychologie und psychotherapie, 32,* 117–128.

Rodin, J. (1986). Aging and health: Effects of the sense of control. *Science, 233,* 1271–1276.

Rodin, J., & Langer, E. J. (1977). Long-term effects of a control relevant intervention with the institutionalized aged. *Journal of Personality and Social Psychology, 35,* 897–902.

Rodin, J., Solomon, S., & Metcalf, J. (1979). Role of control in mediating perceptions of density. *Journal of Personality and Social Psychology, 36,* 988–999.

Schulz, R. (1976). Effects of control and predictability on the psychological well-being of the institutionalized aged. *Journal of Personality and Social Psychology, 33,* 563–573.

connect to the topic in various ways and are the central focus of sexual behavior of most animals. For humans, however, sexual activity is as much a *psychological* process. Think about it: sexual attraction, sexual desire, and sexual functioning are all dependent in many ways upon psychology. If you doubt this, just consider a couple of obvious facts. You know that most people engage in sexual behavior for many reasons other than reproduction. Those reasons are usually psychological. Also, as far as we know, humans are the only species on Earth to suffer from sexual problems such as hypoactive (low) sexual desire, problems with orgasm, erectile dysfunction, premature ejaculation, vaginismus, and so on. These problems often have psychological causes.

Having said that, however, you should be aware at the outset of this discussion that the full expression of ourselves as sexual beings, as well as the successful treatment of sexual problems, depends on a clear and thorough understanding of our sexual functioning: the *physiology* of human sexual response. This is what Masters and Johnson set out to study.

Prior to the 1960s, the definitive works on the sexual behavior of humans were the large-scale surveys of Americans' sexual activities published by Alfred Kinsey in the late 1940s and early 1950s. The famous Kinsey Reports, *Sexual Behavior in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953), asked thousands of men and women about their sexual behavior and attitudes, including topics ranging from frequency of intercourse to masturbation habits to homosexual experiences. With the publication of these reports, suddenly humans had a measure against which to compare their own sexual lifestyles and make relative judgments of their personal sexual behaviors. The Kinsey Reports offered a rare glimpse into the sexuality of humans, and the publications are still cited today as a source of statistical information about sexual behavior. The importance of Kinsey's work notwithstanding, his research only provided information about what people say they do sexually. A conspicuous gap remained in our knowledge about what happens to us physically when we engage in sexual behavior and what people should to do if they are experiencing some kind of sexual problem.

Enter Masters and Johnson. These are names that have become synonymous with human sexuality research and are recognized by millions throughout the world. As the 1960s began, the United States was launched into what has now become known as the "sexual revolution." The sweeping social changes that were taking place provided an opportunity for open and frank scientific exploration of our sexuality that would not have been possible previously. Until the 1960s, lingering Victorian messages that sexual behavior is something secretive, hidden, and certainly not a topic of discussion, much less study, precluded virtually all support, social and financial, for Masters and Johnson's project. But as men and women began to acknowledge more openly the fact that we are sexual beings, with sexual feelings and desires, the social climate became one that was ready not only to accept the research of Masters and Johnson but to demand it. Behavioral statistics were no longer enough. People were ready to learn about their physical responses to sexual stimulation.

It was within this social context that Masters and Johnson began to study human sexual response. Their early work culminated in the book that is the subject of this discussion. Although this work was carried out more than three decades ago, it continues to influence our knowledge of the physiology of sexual response.

THEORETICAL PROPOSITIONS

The most important proposition in Masters and Johnson's research was that to understand human sexuality we must study actual sexual behaviors as they occur in response to sexual stimulation, rather than simply record what people perceive or believe their sexual experiences to be.

Their objective in proposing this theory was a therapeutic one: to help people overcome sexual problems that they might be experiencing. Masters and Johnson expressed this goal as follows:

> [The] fundamentals of human sexual behavior cannot be established until two questions are answered: What physical reactions develop as the human male and female respond to effective sexual stimulation? Why do men and women behave as they do when responding to effective sexual stimulation? If human sexual inadequacy ever is to be treated successfully, the medical and behavioral professions must provide answers to these basic questions. (p. 4)

Combined with this objective, Masters and Johnson also proposed that the only method by which such answers could be obtained was direct systematic observation and physiological measurements of men and women in all stages of sexual responding.

METHOD

Participants

As you might imagine, the first hurdle in a research project such as this is obtaining participants. The project required volunteers who would be willing to engage in sexual acts in a laboratory setting while being closely observed and monitored. Obviously, the researchers were concerned that such a requirement might create the impossibility of finding participants who would represent the general population. Another concern was that the strange and artificial environment of the research lab might cause participants who did volunteer for the study to be unable to respond in their usual ways.

During the early phases of their study, Masters and Johnson employed prostitutes as participants. This decision was based on their assumption that individuals from more average and typical lifestyles would refuse to participate. Prostitutes were studied extensively for nearly 2 years: 8 females and 3 males. The researchers described the contributions of these first 11 participants as being crucial to the development of the methods and research techniques used throughout the entire study.

These participants, however, did not constitute an appropriate group on which to base an extensive study of human sexual response. This was because

TABLE 21-1 Distribution of Participants by Age, Gender, and Educational Level

AGE	NUMBER OF MALES	NUMBER OF FEMALES	HIGH SCHOOL	COLLEGE	GRADUATE SCHOOL
18–20	2	0	2	0	0
21–30	182	120	86	132	84
31–40	137	111	72	98	78
41–50	27	42	18	29	22
51–60	23	19	15	15	12
61–70	8	14	7	11	4
71–80	3	4	3	3	1
81–90	0	2	0	2	0
Totals	382	312	203	290	201

(Adapted from pp. 13–15.)

their lifestyle and sexual experiences did not even remotely represent the population at large. Therefore, the researchers knew that any findings based on this participant group could not be credibly applied to people in general. It was necessary, therefore, to obtain a more representative sample of participants. Contrary to their earlier assumption, the researchers did not find this as difficult as they had anticipated.

Through their contacts in the academic, medical, and therapeutic communities in a large metropolitan area, Masters and Johnson were able to enlist a large group of volunteers from a wide range of socioeconomic and educational backgrounds. The age, gender, and educational demographics of the participants who were eventually chosen are summarized in Table 21-1. All volunteers were carefully interviewed to determine their reasons for participating and their ability to communicate on issues of sexual responsiveness. The prospective participants also agreed to a physical exam to ensure anatomical normalcy.

Procedures

To study in detail the physiological responses of the human body during sexual activity and stimulation, a wide variety of methods of measurement and observation were necessary. These included such standard measures of physiological response as pulse, blood pressure, and rate of respiration. In addition, specific sexual responses were to be observed and recorded. For this, the "sexual activity of study subjects included, at various times, manual and mechanical manipulation, natural coition [intercourse] with the female partner in supine, superior, or knee-chest position, and, for many female study subjects, artificial coition in the supine or knee-chest positions" (p. 21). What all that means is that sometimes participants were observed and measured while having intercourse in various positions, and other times they were observed and measured during masturbation either manually or with mechanical devices specially designed to allow for clear recording of response.

These special devices, designed by physicists, were, basically, clear plastic artificial penises that allowed for internal observations without distortion. These could be adjusted in size for the woman's comfort and were controlled completely by the woman for depth and rate of movement in the vagina throughout the response cycle.

PARTICIPANT ORIENTATION AND COMFORT

You can imagine that all these expectations, observations, and devices might create some real emotional difficulties for the participants, and Masters and Johnson were acutely aware of these potential difficulties. To help place participants at ease with the study's procedures, they ensured the following:

> Sexual activity was first encouraged in privacy in the research quarters and then continued with the investigative team present until the study subjects were quite at ease in their artificial surroundings. No attempt was made to record reactions . . . until the study subjects felt secure in their surroundings and confident of their ability to perform. . . . This period of training established a sense of security in the integrity of the research interest and in the absolute anonymity embodied in the program. (pp. 22–23)

Some participants were involved in only one recording session, while others participated actively for several years. For the research included in the book that is the topic of discussion here, Masters and Johnson estimated that they were able to study 10,000 complete sexual response cycles with female observation outnumbering male observation by a ratio of 3 to 1. In their words, "a minimum of 7,500 complete cycles of sexual response have been experienced by female study participants cooperating in various aspect of the research program, as opposed to a minimum total of 2,500 male orgasmic (ejaculatory) experiences" (p. 15).

RESULTS

Masters and Johnson discovered a wealth of information about human sexual response, and some of their findings are summarized in the pages ahead. However, another aspect of their research to keep in mind is that much of what they found from their sample of participants is true of most people. Of course, some exceptions exist, but in general, everyone's basic physiological responses to sexual stimulation are similar. You must remember, though, as you read about their early findings, that Masters and Johnson's research did *not* address sexual attitudes, emotions, morals, values, preferences, orientations, or likes or dislikes. These matters clearly are *not* similar for everyone, and it is our individual variations in these issues that create the vast and wondrous diversity that exists in human sexuality. Let's look at some of Masters and Johnson's most influential findings.

The Sexual Response Cycle

After studying approximately 10,000 sexual events, Masters and Johnson found that human sexual response could be divided into four stages which,

TABLE 21-2 Masters and Johnson's Stages of the Sexual Response Cycle

STAGE	FEMALE RESPONSE SUMMARY	MALE RESPONSE SUMMARY
Excitement	First sign: vaginal lubrication. Clitoral glans becomes erect. Nipples become erect, breasts enlarge. Vagina increases in length, and inner two-thirds of vagina expands.	First sign: erection of penis. Time to erection varies (with person, age, alcohol/drug use, fatigue, stress, etc.). Skin of scrotum pulls up toward body, testes rise. Erection may be lost if distracted but usually regained readily.
Plateau	Outer one-third of vagina swells, reducing opening by up to 50%. Inner two-thirds of vagina continues to balloon or "tent." Clitoris retracts toward body and under hood. Lubrication decreases. Minor lips engorge with blood and darken in color, indicating orgasm is near. Muscle tension and blood pressure increase.	Full erection attained; not lost easily if distracted. Corona enlarges further. Cowper's gland secretes pre-ejaculate fluid. Testes elevate further, rotate, and enlarge, indicating orgasm is near. Muscle tension and blood pressure increase.
Orgasm	Begins with rhythmic contractions in pelvic area at intervals of 0.8 second, especially in muscles behind the lower vaginal walls. Uterus contracts rhythmically as well. Muscle tension increased throughout body. Duration recorded from 7.4 seconds to 104.6 seconds. Length does not equal perceived intensity.	Begins with pelvic contractions 0.8 second apart. Ejaculation, the expelling of semen, occurs in two phases: (1) emission (semen builds up in urethral bulb, producing sensation of ejaculatory inevitability); (2) expulsion (genital muscles contract, forcing semen out through urethra).
Resolution	Clitoris, uterus, vagina, nipples, etc., return to unaroused state in less than 1 minute. Clitoris often remains very sensitive to touch for 5 to 10 minutes. This process may take several hours if woman has not experienced an orgasm.	Approximately 50% loss of erection within 1 minute; more gradual return to fully unaroused state. Testes reduce in size and descend. Scrotum relaxes.

they termed the *human sexual response cycle.* These stages are excitement, plateau, orgasm, and resolution (Table 21-2). Although they acknowledge in their book that the stages were arbitrarily defined, these divisions made the discussion of sexual response easier and clearer. Today, human sexual response is rarely discussed in academic or professional settings without reference to these four stages.

Sexual Anatomy

One of the great contributions made by Masters and Johnson in their research on sexual response was the dispelling of sexual myths. And one area of widespread misunderstanding that the researchers attempted to correct relates to sexual anatomy—specifically, the penis and the vagina. Throughout history, one of the most common sexual concerns expressed by men has related to penis size. Masters and Johnson studied a lot of penises and could finally shed some

scientific light on these concerns. They called them "phallic fallacies." The two worries men have expressed are (a) larger penises are more effective in providing satisfying sexual stimulation for the woman and (b) their own penis is too small. Masters and Johnson demonstrated that both concerns are misguided by revealing actual average penis sizes found in their research and explaining the functioning of the penis and vagina during heterosexual intercourse.

The researchers found that the normal range for flaccid penile length in this study population was between 2.8 inches and 4.3 inches, with an average length of about 3 inches. For erect penises the average length ranged from about 5.5 inches to just under 7 inches, with an average of about 6 inches. These numbers were significantly smaller than the commonly held beliefs about what constitutes a large versus a small penis. But what was even more surprising was that when they measured the size of erect penises, the researchers found that a larger flaccid penis does not predict a larger erect penis. In fact, they discovered overall that smaller flaccid penises tend to enlarge more upon sexual excitement than do penises that are larger in their flaccid state. Looking at averages, a flaccid penis of 3 inches increased to a length of 6 inches, but a 4-inch flaccid penis only added about 2.5 inches to reach a length of 6.5 inches. To further illustrate this finding, Masters and Johnson reported the largest and smallest observed change from flaccid to erect state. One male participant was found to have a flaccid penile length of 2.8 inches. The increase that was observed in this participant upon erection was 3.3 inches, to an erect length of 6.1 inches. Another participant who was measured flaccid at 4 inches increased only 2.1 inches, for an identical erect length of 6.1 inches.

More important than all these measurements of penises is the notion that a woman's sexual enjoyment and satisfaction depend on penis size. Masters and Johnson's research, as explained in a section titled "Vagina Fallacies" found that idea to be totally without merit. In their careful observations using the artificial penis technique described earlier, they determined that the vagina is an extremely elastic structure capable of accommodating penises of varying size. "Full accommodation usually is accomplished with the first few thrusts of the penis regardless of penile size" (p. 194). Furthermore, they found that during the plateau stage of the response cycle (see Table 21-2), the walls of the vaginal opening swell to envelop a penis of virtually any size. Therefore, as the authors conclude, "It becomes obvious that penile size usually is a minor factor in sexual stimulation of the female partner" (p. 195).

Female and Male Differences in Sexual Response

Although Masters and Johnson demonstrated many similarities in the sexual response cycles of men and women, they also pointed out some important differences. Their most famous and most revolutionary finding concerned the orgasm and resolution stages of the cycle. Following orgasm, both men and women enter the resolution stage, when sexual tension decreases rapidly and sexual structures return to their unaroused states (this is also known as *detumescence*). Masters and Johnson found that during this time, a

man experiences a *refractory period,* during which he is physically incapable of experiencing another orgasm regardless of the type or amount of stimulation he receives. This refractory period may last from several minutes to several hours or even a day, and it tends to lengthen as a man ages.

Masters and Johnson found that many women do not appear to have a refractory period and with continued, effective stimulation are capable of experiencing one or more additional orgasms following the first, an experience referred to as *multiple orgasms.* The researchers reported that women, unlike men, are "capable of maintaining an orgasmic experience for a relatively long period of time" (p. 131).

While this multiorgasmic capacity was not news to many women, it was not widely known. Prior to Masters and Johnson's work, it was commonly believed that men had the greater orgasmic capabilities. Consequently, this finding, as well as many others in Masters and Johnson's research, had a far-reaching impact on cultural and societal attitudes about male and female sexuality. It should be noted here that although most women are physiologically capable of multiple orgasms, not all women seek or even desire them. Indeed, many women have never experienced multiple orgasms and are completely satisfied with their sexual lives. Also, many women who have had multiple orgasms find that they also are usually satisfied with a single orgasm. The important point is that individuals vary greatly in terms of what is physically and emotionally satisfying sexually. Masters and Johnson were attempting to address the full range of physiological possibilities.

CRITICISMS

Most of the criticisms of Masters and Johnson's early research focus either on the arbitrary nature of their four stages of sexual response or on the fact that they spent little time discussing the cognitive and emotional aspects of sexuality. However, Masters and Johnson addressed these criticisms in their early writings.

As mentioned previously, the authors were fully aware that their four sexual response phases were purely arbitrary but that the divisions were helpful in researching and explaining the complex process of sexual response in humans. Other researchers over the years have suggested different stage theories. For example, Helen Singer Kaplan (Kaplan, 1974) proposed a three-stage model that includes desire, vasocongestion (engorgement of the genitals), and muscle contractions (orgasm). These stages reflect Kaplan's belief that an analysis of sexual response should begin with sexual desire before any sexual stimulation begins, and she suggests that no distinction can or need be drawn between excitement and plateau. Her focus on the desire aspect of sexuality leads into the other main criticism of Masters and Johnson's original work: the lack of attention to psychological factors.

Masters and Johnson acknowledged that an examination of psychological and emotional factors was not the goal of the project. They did believe, however, that a complete understanding of the *physiological* side of sexual behavior was a necessary prerequisite for a satisfying and fulfilling sex life. And

they demonstrated this belief in subsequent books dealing with the psychological and emotional aspects of our sexuality.

Over the 30 years since Masters and Johnson's first book appeared, some research has questioned some of their findings as they apply to all humans. For example, research has demonstrated that some women may experience a refractory period during which time they are incapable of experiencing additional orgasms, and a small percentage of men may be capable of multiple orgasms with little or no refractory period between them. Also, although ejaculation was thought to be entirely the domain of men, recent research demonstrates that some women may, under some circumstances, ejaculate at orgasm (see Zaviacic, 2002, for a discussion of this research).

RECENT APPLICATIONS

It would be impossible to list here even a representative sample of the numerous articles and books published each year that refer substantively to Masters and Johnson's early work on human sexual response. These publications range from basic core texts in human sexuality (e.g., Hock, 2007; McAnulty & Burnette, 2004) to very specific, cutting-edge articles in psychology and sexuality journals.

In addition, as you might imagine, Masters and Johnson's model was and continues to generate controversy. Probably the most lively debate today revolves around whether their four-phase model can be applied to both men and women, as the researchers suggested.

One study in this vein incorporated Masters and Johnson's pioneering work in designing, administering, and analyzing responses to a national survey of sexual satisfaction among nearly 1,000 women, ages 20 to 65 years, in heterosexual relationships (Bancroft et al., 2003). The goal of the study was to examine whether women's sexual problems may be viewed as similar to men's sexual problems and to what extent pharmacological treatments might be helpful for women, in the way that erectile disorder drugs (Viagra, Levitra, Cialis) have helped many men. The study found that problems with the physical side of sexual response (arousal, vaginal lubrication, orgasm) were *not* strongly related to sexual distress among the respondents: "The overall picture is that lack of emotional well-being and negative emotional feelings during sexual interaction with the partner are more important determinants of sexual distress than impairment of the more physiological aspects of female sexual response. Although we do not have directly comparable data for men, we can predict that the pattern would be different, with greater importance attached to genital response" (Bancroft et al., 2003, p. 202). In other words, women's most common sexual problems may be far too complex to be solved with just a "little *pink* pill."

Indeed, in 2000, a new approach to understanding female sexual problems was developed by a collaborative group of 12 women scientists, researchers, and clinicians who argued that, sexually, men and women are more different than they are similar and that Masters and Johnson's four-phase model is invalid in describing, explaining, or treating sexual problems in women (see Tiefer, 2001). This "new view of women's sexual problems" contends that "women's accounts do

not fit neatly into the Masters and Johnson model; for example, women generally do not separate 'desire' from 'arousal,' [and] women care less about physical than [about] subjective arousal" (Tiefer, 2001, p. 93). The researchers propose that Masters and Johnson's model which, for the most part, equates male and female sexual response, fails to take into account some important factors that are necessary to understand women's sexual problems. These include the context of the relationship in which the sexual responding is occurring and individual differences among women in their sexual response patterns. More specifically, they suggest that women's sexual difficulties require a classification system that takes into account cultural, political, and economic factors (e.g., lack of sexuality education or access to contraception); a woman's partner and issues in the relationship (e.g., fear of abuse, imbalance of power, overall discord); psychological factors (e.g., past sexual trauma, depression, anxiety); and medical factors (e.g., hormonal imbalances, sexually transmitted infections, medication side effects).

Thanks in large part to the work of Masters and Johnson, our understanding of the physical processes involved in human sexual pleasure and response is quite advanced compared to a half century ago, but we still have a great deal to learn. Undoubtedly, with Masters and Johnson's groundbreaking studies as a backdrop, research will continue and our insights into human sexual response will expand.

CONCLUSIONS

In 1971, Masters and Johnson were married. Over the following two decades, they continued to work and publish as a team. In 1992, due to increasing differences between them about the direction of their research and retirement, the couple divorced and Johnson went into retirement. Masters continued as director of the Masters and Johnson Institute in St. Louis until his retirement in 1994. He died from complications of Parkinson's disease on February 16, 2001, at the age of 85.

You'll recall from the beginning of this discussion that the main goal of Masters and Johnson's research was to address problems of sexual inadequacy—to help people solve their sexual problems. Almost without question they have done that. Virtually all sex therapy, whether for erectile problems, orgasm difficulties, rapid ejaculation, inhibited arousal issues, or any other sexual problem rests on a basic foundation of Masters and Johnson's research. It is impossible to overestimate the contributions of Masters and Johnson in our understanding and study of human sexuality. An examination of any recent sexuality textbook will reveal more citations for and more space devoted to the work of Masters and Johnson than to any other researchers. But beyond this, William Masters and Virginia Johnson, over the decades following the publication of *Human Sexual Response* (which forms the basis of this reading), continued researching and applying their findings to help people attain sexual fulfillment. Four years after the publication *Human Sexual Response*, they released *Human Sexual Inadequacy* (1970), which applied their earlier research

directly to solutions for sexual problems. Their continuous attention to their chosen field is demonstrated by a list of their subsequent books:

The Pleasure Bond (1970); *Homosexuality in Perspective* (1979); *Human Sexuality* (1995); *Crisis: Heterosexual Behavior in the Age of AIDS* (1988); *Masters and Johnson on Sex and Human Loving* (1986); and *Heterosexuality* (1998).

Bancroft, J., Loftus, J., & Long, J. (2003). Distress about sex: A national survey of women in heterosexual relationships. *Archives of Sexual Behavior, 32,* 193–208.

Hock, R. R. (2007). *Human sexuality.* Upper Saddle River, NJ: Pearson Prentice Hall.

Kaplan, H. S. (1974). *The new sex therapy.* New York: Brunner/Mazel.

Kinsey, A., Pomeroy, W., Martin, C., & Gebhard, P. (1948). *Sexual behavior in the human male.* Philadelphia: W. B. Saunders.

Kinsey, A., Pomeroy, W., Martin, C., & Gebhard, P. (1953). *Sexual behavior in the human female.* Philadelphia: W. B. Saunders.

McAnulty, R. D., & Burnette, M. M. (2004) *Exploring human sexuality: Making healthy decisions,* 2nd ed. Boston: Pearson Allyn & Bacon.

Tiefer, L. (2001). A new view of women's sexual problems: Why new? Why now? *Journal of Sex Research, 38,* 89–96.

Zaviacic, Milan (2002). Female urethral expulsions evoked by local digital stimulation of the G-spot: Differences in the response patterns. *Journal of Sex Research, 24,* 311–18.

Reading 22: I CAN SEE IT ALL OVER YOUR FACE!

Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17,* 124–129.

Think of something funny. What is the expression on your face? Now think of something in your past that made you sad. Did your face change? Chances are it did. Undoubtedly, you are aware that certain facial expressions coincide with specific emotions. And, most of the time, you can probably tell how people are feeling emotionally from the expressions on their faces. Now, consider this: Could you be equally successful in determining someone's emotional state based on facial expression if that person is from a different culture—say, Romania, Sumatra, or Mongolia? In other words, do you believe facial expressions of emotion are universal? Most people believe that they are, until they stop and consider how radically different other cultures are from their own. Think of the multitude of cultural differences in styles of dress, gestures, personal space, rules of etiquette, religious beliefs, attitudes, and so on. With all these differences influencing behavior, it would be rather amazing if any human characteristics, including emotional expressions, were identical across all cultures.

Paul Ekman is considered the leading researcher in the area of the facial expression of emotion. This article details his early research, which was designed to demonstrate the universality of these expressions. Although the authors acknowledged in their introduction that previous researchers had found some evidence that facial behaviors are determined by culturally variable learning, they argued that previous studies were poorly done and, in reality, expressions for basic emotions are equivalent in all cultures.

Several years prior to this study, Ekman and Friesen had conducted research in which they showed photographs of faces to college-educated people

in Argentina, Brazil, Chile, Japan, and the United States. All the participants from every country correctly identified the same facial expressions as corresponding to the same emotions regardless of the nationality of the person in the photo. The researchers presented their findings as evidence of the universality of emotional expressions. However, as Ekman and Friesen themselves pointed out, these findings were open to criticism because members of the cultures studied had all been exposed to international mass media (movies, magazines, television), which are full of facial expressions that might have been transmitted to all these countries. What was needed to prove the universality of emotional expression was to study a culture that had not been exposed to any of these influences. Imagine how difficult (perhaps impossible) it would be to find such a culture given today's mass media. Well, even in 1971 it wasn't easy.

Ekman and Friesen traveled to the southeast highlands of New Guinea to find participants for their study among the Fore people who still existed as an isolated Stone Age society. Many of the members of this group had experienced little or no contact with modern cultures. Therefore, they had not been exposed to emotional facial expressions other than those of their own people.

THEORETICAL PROPOSITIONS

The theory underlying Ekman and Friesen's study was that specific facial expressions corresponding to basic emotions are universal. Ekman and Friesen stated it quite simply:

> The purpose of this paper was to test the hypothesis that members of a preliterate culture who had been selected to ensure maximum visual isolation from literate cultures will identify the same emotion concepts with the same faces as do members of literate Western and Eastern cultures. (p. 125)

METHOD

The most isolated subgroup of the Fore were those referred to as the South Fore. The individuals selected to participate in the study had seen no movies, did not speak English or Pidgin, had never worked for a Westerner, and had never lived in any of the Western settlements in the area. A total of 189 adults and 130 children were chosen to participate, out of a total South Fore population of about 11000. For comparison, 23 adults were chosen who had experienced a great deal of contact with Western society through watching movies, living in the settlements, and attending missionary schools.

Through trial and error, the researchers found that the most effective method of asking the participants to identify emotions was to present them with three photographs of different facial expressions and to read a brief description of an emotion-producing scene or story that corresponded to one of the photographs. The participant could then simply point to the expression that best matched the story. The stories used were selected very carefully to be sure that each scene was related to only one emotion and that it was recognizable to the Fore people. Table 22-1 lists the six stories developed by Ekman

TABLE 22-1 Ekman and Friesen's Stories Corresponding to Six Emotions

EMOTION	STORY
1. Happiness	His (her) friends have come and he (she) is happy.
2. Sadness	His (her) child (mother) has died and he (she) feels very sad.
3. Anger	He (she) is angry and about to fight.
4. Surprise	He (she) is just now looking at something new and unexpected.
5. Disgust	He (she) is looking at something he (she) dislikes; or he (she) is looking at something that smells bad.
6. Fear	He (she) is sitting in his (her) house all alone and there is no one else in the village. There is no knife, ax, or bow and arrow in the house. A wild pig is standing in the door of the house and the man (woman) is looking at the pig and is very afraid of it. The pig has been standing in the doorway for a few minutes, and the person is looking at it very afraid, and the pig won't move away from the door, and he (she) is afraid the pig will bite him (her).

(Adapted from p. 126.)

and Friesen. The authors explained that the fear story had to be longer to prevent the participants from confusing it with surprise or anger.

A total of 40 photographs of 24 different people, including men, women, boys, and girls, were used as examples of the six emotional expressions. These photographs had been validated previously by showing them to members of various other cultures. Each photograph had been judged by at least 70% of observers in at least two literate Western or Eastern cultures to represent the emotion being expressed.

The actual experiment was conducted by teams consisting of one member of the research group and one member of the South Fore tribe, who explained the task and translated the stories. Each adult participant was shown 3 photographs (1 correct and 2 incorrect), told the story that corresponded to one of them, and asked to choose the expression that best matched the story. The procedure was the same for the children, except that they only had to choose between 2 photographs, 1 correct and 1 incorrect. Each participant was presented with various sets of photographs so that no single photograph ever appeared twice in the comparison.

The translators received careful training to ensure that they would not influence the participants. They were told that no responses were absolutely right or wrong and were asked not to prompt the participants. Also, they were taught how to translate the stories exactly the same way each time and to resist the temptation to elaborate and embellish them. To avoid unintentional bias, the Western member of the research team avoided looking at the participant and simply recorded the answers given.

Remember that these were photographs of expressions of emotions on the faces of Westerners. Could the Fore people correctly identify the emotions in the photographs, even though they never had seen a Western face before?

TABLE 22-2 Percent of Adults Correctly Identifying Emotional Expression in Photographs

EMOTION IN STORY	NUMBER OF PARTICIPANTS	PERCENT CHOOSING CORRECT PHOTOGRAPH
Happiness	220	92.3
Anger	98	85.3
Sadness	191	79.0
Disgust	101	83.0
Surprise	62	68.0
Fear	184	80.5
Fear (with surprise)	153	42.7

(Adapted from p. 127.)

RESULTS

First, analyses were conducted to determine if any responses differed between males and females or between adults and children. The adult women tended to be more hesitant to participate and had experienced less contact with Westerners than the men had. However, no significant differences in ability to correctly identify the emotions in the photographs were found among any of the groups.

Tables Table 22-2 and Table 22-3 summarize the percentage of correct responses for the six emotions by the least Westernized adults and the children, respectively. Not all participants were exposed to all emotions, and sometimes participants were exposed to the same emotion more than once. Therefore, the number of participants in the tables does not equal the overall total number of participants. All the differences were statistically significant except when participants were asked to distinguish fear from surprise. In this situation, many errors were made, and, for one group, surprise was actually selected 67% of the time when the story described fear.

The researchers also compared the Westernized and non-Westernized adults. No significant differences between these two groups were found on

TABLE 22-3 Percent of Children Correctly Identifying Emotional Expressions in Photographs

EMOTION IN STORY	NUMBER OF PARTICIPANTS	PERCENT CHOOSING CORRECT PHOTOGRAPH
Happiness	135	92.8
Anger	69	85.3
Sadness	145	81.5
Disgust	46	86.5
Surprise	47	98.3
Fear	64	93.3

(Adapted from p. 127.)

the number who chose the correct photographs. Also, no differences were found between younger and older children. As you can see in Table 22-3, the children appeared to perform better than the adults, but Ekman and Friesen attributed this to the fact that they had to choose between only 2 photographs instead of 3.

Discussion Ekman and Friesen did not hesitate to draw a confident conclusion from their data: "The results for both adults and children clearly support our hypothesis that particular facial behaviors are universally associated with particular emotions" (p. 128). They based their conclusion on the fact that the South Fore group had no opportunity to learn anything about Western expressions and, thus, had no way of identifying them, unless the expressions were universal.

As a way of double-checking their findings, the researchers videotaped members of the isolated Fore culture portraying the same six facial expressions. Later, when these tapes were shown to college students in the United States, the students correctly identified the expressions corresponding to each of the emotions:

> The evidence from both studies contradicts the view that all facial behavior associated with emotion is culture-specific, and that posed facial behavior is a unique set of culture-bound conventions not understandable to members of another culture. (p. 128)

The one exception to their consistent findings—that of the confusion participants seemed to experience in distinguishing between expressions of fear and surprise—Ekman and Friesen explained by acknowledging certainly some cultural differences are seen in emotional expression, but this did not detract from the preponderance of evidence that nearly all the other expressions were correctly interpreted across the cultures. They speculated that fear and surprise may have been confused "because in this culture fearful events are almost always also surprising; that is, the sudden appearance of a hostile member of another village, the unexpected meeting of a ghost or sorcerer, etc." (p. 129).

IMPLICATIONS OF THE RESEARCH

This study by Ekman and Friesen served to demonstrate scientifically what you already suspected: facial expressions of emotions are universal. However, you might still be asking yourself "What is the significance of this information?" Well, part of the answer to that question relates to the nature–nurture debate over whether human behaviors are present at birth or are acquired through learning. Because facial expressions for the six emotions used in this study appear to be influenced very little by cultural differences, it is possible to conclude that they must be innate, that is, biologically *hard-wired* in the brain at birth.

Another reason behavioral scientists find the notion of universal emotional expressions interesting is that it addresses issues about how humans evolved. In 1872, Darwin published his famous book *The Expression of Emotion*

in Man and Animals. He maintained that facial expressions were adaptive mechanisms that assisted animals in adapting to their environment, thereby enhancing their ability to survive. The idea behind this was that if certain messages could be communicated within and across species of animals through facial expressions, the odds of surviving and reproducing would be increased. For example, an expression of fear would provide a silent warning of imminent danger from predators; an expression of anger would warn less dominant members of the group to stay away from more powerful ones; and an expression of disgust would communicate a message of "Yuck! Don't eat that, whatever you do" and prevent a potential poisoning. These expressions, however, would do the animals no good if they were not universally recognized among all the individuals making up the species. Even though these expressions may now be less important to humans in terms of their survival value, the fact that they are universal among us would indicate that they have been passed on to us genetically from our evolutionary ancestors and have assisted us in reaching our present position on the evolutionary ladder.

A fascinating study demonstrated this *leftover* survival value of facial expressions in humans. The researchers (Hansen & Hansen, 1988) reasoned that if facial expressions could warn of impending danger, then humans should be able to recognize certain expressions, such as anger, more easily than other, less threatening expressions. To test this, they presented participants with photographs of large crowds of people with different facial expressions. In some of the photographs, all the people's expressions were happy except for one that was angry. In other photographs, all the expressions were angry, except for one that was happy. The participants' task was to pick out the face that was different. The amount of time it took the participants to find a single happy face in a crowd of angry faces was significantly longer than when they searched a crowd of happy faces for a single angry face. Furthermore, as the size of the crowds in the photographs increased, the time for participants to find the happy face also increased, but finding the angry face did not take significantly longer. This and other similar findings have indicated that humans may be biologically programmed to respond to the information provided by certain expressions better than others because those expressions offered more survival information.

RECENT APPLICATIONS

Other more recent studies in various areas of research have relied on Ekman's early findings in attempting to improve our understanding of children and adults with developmental or learning disabilities. One such study found that children diagnosed with autism (a pervasive developmental disorder marked by language deficits, social withdrawal, and repetitive self-stimulation behaviors) appear to have difficulty recognizing the facial expressions that correspond to basic emotions (Bolte & Poustka, 2003). This difficulty was even

more pronounced in families with more than one autistic child and may help explain why many autistic individuals show difficulty interpreting emotional responses from others.

The influence of Ekman's research, however, is not limited to humans. Ekman's 1971 study has been cited in research on the emotions of, believe it or not, *farm animals* (Desire, Boissy, & Veissier, 2002). These researchers suggest that the welfare of farm animals depends, in part, on their emotional reactions to their environment. When individual animals feel in harmony with their environment, their welfare is maximized; however, "any marked deviation from the state, if perceived by the individual, results in a welfare deficit due to negative emotional experiences" (p. 165).

A study citing Ekman's 1971 article attempted to shed light on exactly how one, specific facial feature—the eyebrows—contributes to facial recognition (Sadr, Jarudi, & Sinha, 2003). Previous research had centered more on the eyes and mouth, but these researchers found that the eyebrows may be more important than the eyes themselves. The authors concluded "that the absence of eyebrows in familiar faces leads to a very large and significant disruption in recognition performance. In fact, a significantly greater decrement in face recognition is observed in the absence of eyebrows than in the absence of eyes" (p. 285). So, if you are ever in need of an effective disguise, be sure to cover your eyebrows!

CONCLUSION

Over the past three decades following his early cross-cultural studies on emotional expressions, Ekman has continued his research individually and in collaboration with Friesen and several other researchers. Within this body of work, many fascinating discoveries have been made. One further example of Ekman's research involves what is called the *facial feedback theory* of emotional expressions. The theory states that the expression on your face actually feeds information back to your brain to assist you in interpreting the emotion you are experiencing. Ekman tested this idea by identifying the exact facial muscles involved in each of the six basic emotions. He then instructed participants to tense these muscles into expressions resembling the various emotions. When they did this, Ekman was able to measure physiological responses in the participants that corresponded to the appropriate emotion resulting from the facial expression alone, and not from the actual presence of the emotion itself (Ekman, Levensen, & Friesen, 1983).

Ekman has also extended his research into the area of deception and how the face and the body *leak* information to others about whether someone is telling the truth. In general, his findings have indicated that people are able to detect when others are lying at a slightly better than chance level when observing just their facial expressions. However, when allowed to observe another's entire body, participants were much more successful in detecting lies, indicating that the body may provide better clues to certain states

of mind than the face alone (see Ekman, 1985, for a complete discussion of this issue). Most recently, Ekman has distilled his extensive research in a book titled, *Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life,* written to help all of us apply his work on the recognition of the meaning of facial expressions to improving our communication and interactions with romantic partners, children, coworkers and even strangers (Ekman, 2007).

Ekman and his associates have provided us with a large literature on the nonverbal communication provided by facial expressions (see Ekman, 2003). And research in this area continues. It is likely that studies will continue as we become increasingly skilled at the process that was the title of Ekman and Friesen's 1975 book, *Unmasking the Face.*

Bolte, S., & Poustka, F. (2003). The recognition of facial affect in autistic and schizophrenia subjects and their first-degree relatives. *Psychological Medicine, 33,* 907–915.
Darwin, C. R. (1872). *The expression of the emotions in man and animals.* London: John Murray.
Desire, L., Boissy, A., & Veissier, I. (2002). Emotions in farm animals: A new approach to animal welfare in applied ethology. *Behavioural Processes, 60,* 165–180.
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Ekman, P. (2007). *Emotions revealed: Recognizing faces and feelings to improve communication and emotional life.* New York: Henry Holt.
Ekman, P., & Friesen, W. (1975). *Unmasking the face.* Englewood Cliffs, NJ: Prentice-Hall.
Ekman, P., Levensen, R., & Friesen, W. (1983). Autonomic nervous system activity distinguishes between emotions. *Science, 164,* 86–88.
Hansen, C., & Hansen, R. (1988). Finding the face in the crowd: An anger superiority effect. *Journal of Personality and Social Psychology, 54,* 917–924.
Sadr, J., Jarudi, I., & Sinha, P. (2003) The role of eyebrows in face recognition. *Perception, 32,* 285–293.

Reading 23: LIFE, CHANGE, AND STRESS

Holmes, T. H., & Rahe, R. H. (1967). The Social Readjustment Rating Scale. *Journal of Psychosomatic Research, 11,* 213–218.

Everyone knows about stress. For most of you, most of the time, stress is an unpleasant, negative experience. *Stress* is a very general term and not easy to define, but one way of looking at it is to think of stress as any extreme emotional reaction. In this sense, extreme fear, anger, sadness, or even happiness could produce stress. Think for a moment about the last time you were experiencing a heavy load of stress: the kind of stress that lasts more than a few hours or even a few days. Maybe you moved to a new city, had a legal problem, were dealing with difficulties in a relationship, changed jobs, lost your job, experienced the death of someone close to you, were injured, or had to cope with some other major upheaval in your life. You know this kind of stress—it goes on for a while and you have to deal with it, for better or worse, every day. What

happened to you at these times? How well did you cope? Did you find that your physical health deteriorated?

The connection between stress and illness is the focus of this chapter and this famous article by Thomas Holmes and Richard Rahe. Take a moment to answer this question: Do you believe in a clear connection between stress and illness? You probably answered with a resounding "Yes!" But if this same question had been posed to people 20 or 30 years ago, only a few would have believed that such an association existed. Over the past couple of decades, researchers in psychology and medicine together have clearly established that this connection does indeed exist, and they have worked to understand it and help people with it. Within the behavioral sciences, those professionals who are primarily concerned with the connection between psychology and health are called *health psychologists.*

The journal in which the article under discussion appears deals with *psychosomatic research.* Psychosomatic illnesses are health problems that are caused primarily by psychological factors rather than physical ones. Such illnesses are real; from a medical perspective, the discomfort, pain, and suffering truly exist. And victims of psychosomatic problems should not be confused with *hypochondriacs,* who suffer from imaginary or exaggerated illnesses.

Health psychologists have established that when changes occur in people's lives that require them to make major internal, psychological adjustments, they tend to experience a higher incidence of *physical* illness. The changes that have this effect are called *life stress.* The amount of life stress you experience varies over time. You may have had times in your past (or present) when many changes were occurring, while at other times life was relatively stable. Life stress also varies greatly from person to person. The overall number of changes that occur in your life is different from the number in someone else's. If I were to ask you how much life stress you have experienced over, say, the past year, what would you say? A lot? Not much? A moderate amount? These kinds of vague judgments are not of much use to scientists who want to study the relationship between stress and illness. Therefore, one of the first questions in this area of research that needed to be answered was this: How can researchers measure life stress?

Obviously, it would not be ethical for psychologists to bring people into a laboratory, expose them to stressful events, and wait for them to become ill. And even if we ignore the ethical considerations of such research (which we cannot), it would not represent how stress works in real life. To tackle this problem, Holmes and Rahe developed a written scale to measure life stress. They acknowledged in their article that previous attempts to examine a person's level of stress only succeeded in determined the number and types of stressful events. They proposed to take this line of reasoning one step further and develop a way to measure the size or magnitude of the stress caused by various life experiences. The idea behind this was that if such a measure could be developed, it would be possible to obtain people's life-stress scores and relate then to their health status.

METHOD

From their clinical experiences, Holmes and Rahe compiled a list of 43 life events that people commonly feel are stressful, in that they require a person to make psychological adjustments to adapt to the event. This list was then presented to nearly 400 participants, who were asked to rate each item on the list for the amount of stress they thought would be produced by the change. The actual instructions given to the participants read, in part, as follows:

> In scoring, use all of your experience in arriving at your answer. This means personal experience where it applies as well as what you have learned to be the case for others. Some persons accommodate to change more readily than others; some persons adjust with particular ease or difficulty to only certain events. Therefore, strive to give your opinion of the average degree of adjustment necessary for each event rather than the extreme. . . . "Marriage" has been given an arbitrary value of 500. As you complete each of the remaining events, think to yourself, "Is this event indicative of more or less readjustment than marriage? Would the readjustment take longer or shorter to accomplish?" (p. 213)

Participants were then instructed to assign a point value to each event relative to the value of 500 given to marriage. If they saw an event as requiring more readjustment than marriage, the point value would be higher, and vice versa. All the participants' ratings for each item were averaged and then divided by 10 to arrive at a score for the individual items.

This was a study with a rather simple and straightforward method. The importance and value of the research lie in the results and the applications of the measuring device, which Holmes and Rahe called the *Social Readjustment Rating Scale (SRRS)*.

RESULTS

Table 23-1 lists the Holmes and Rahe's 43 life events in order by rank, with the average point value that participants assigned to each one. Of the items included on the list, you can see that "death of a spouse" was rated the most stressful, whereas "minor violations of the law" was rated as the least stressful. You might also notice that not all the items are what you might consider to be negative. Events such as Christmas, marriage, and, yes, even a vacation, can be stressful in terms of Holmes and Rahe's definition of *stress:* need for internal, psychological readjustment to the event.

To check for consistency in the ratings, the researchers divided the participants into several subgroups and correlated their ratings of the items. Some of the subgroups they compared were male versus female, single versus married, college-educated versus no college, white versus black, younger versus older, higher socioeconomic versus lower socioeconomic, religious versus nonreligious, and so on. For all the subgroup comparisons, the correlations were very high, indicating a strong degree of agreement among the diverse participants. What this meant was that Holmes and Rahe could assume with a reasonable amount of confidence that this scale could be applied to all people with an approximately equal degree of accuracy.

TABLE 23-1 The Social Readjustment Rating Scale

RANK	LIFE EVENT	MEAN VALUE
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
4	Jail term	63
5	Death of close family member	63
6	Personal injury or illness	53
7	Marriage	50
8	Fired at work	47
9	Marital reconciliation	45
10	Retirement	45
11	Change in health of family member	44
12	Pregnancy	40
13	Sex difficulties	39
14	Gain of new family member	39
15	Business readjustment	39
16	Change in financial state	38
17	Death of close friend	37
18	Change to different line of work	36
19	Change in number of arguments with spouse	35
20	Large mortgage	31
21	Foreclosure of mortgage or loan	30
22	Change in responsibilities at work	29
23	Son or daughter leaving home	29
24	Trouble with in-laws	29
25	Outstanding personal achievement	28
26	Wife begins or stops work	26
27	Begin or end school	26
28	Change in living conditions	25
29	Revision of personal habits	24
30	Trouble with boss	23
31	Change in work hours or conditions	20
32	Change in residence	20
33	Change in schools	20
34	Change in recreation	19
35	Change in church activities	19
36	Change in social activities	18
37	Small mortgage	17
38	Change in sleeping habits	16
39	Change in number of family get-togethers	15
40	Change in eating habits	15
41	Vacation	13
42	Christmas	12
43	Minor violations of the law	11

(Adapted from p. 216.)

DISCUSSION

Holmes and Rahe note in their discussion that a clear, common theme could be applied to all the life events listed on their scale. Every time one of these stressful events occurs in someone's life, they explained, it requires some degree of adaptation, personal adjustment, or coping. "The emphasis," they wrote, "is on change from the existing steady state and not on psychological meaning, emotion, or social desirability" (p. 217). This explains why some of the items may be interpreted as positive by some and negative by others, but either way, internal adjustment is required and stress results.

Remember, this article explains the research behind the development of a method for measuring life stress. If you want to try it yourself, just look down the list and circle the changes that have occurred in your life over the past 12 months. Each change has a certain number of points, *life change units* (LCUs), assigned to it. Calculate your LCU total. This gives you an estimate of your amount of life stress. Take a moment now to find your score. After you've done this, you will probably feel as if something is missing. What's missing is the relationship between your score and your health, which is entirely why the researchers developed the scale. To address this, Holmes and Rahe didn't stop with developing the SRRS but went on together and separately to examine the relationship between their scale and the probability of illness.

SUBSEQUENT RESEARCH

In the late 1960s, the SRRS began to be used in many studies as a tool for examining the relationship between stress and illness. The value of the scale rested on its ability to predict illness based on people's total LCU scores.

In early studies, several thousand people were asked to fill out the SRRS and to report their histories of illness. Figure 23-1 graphically illustrates the

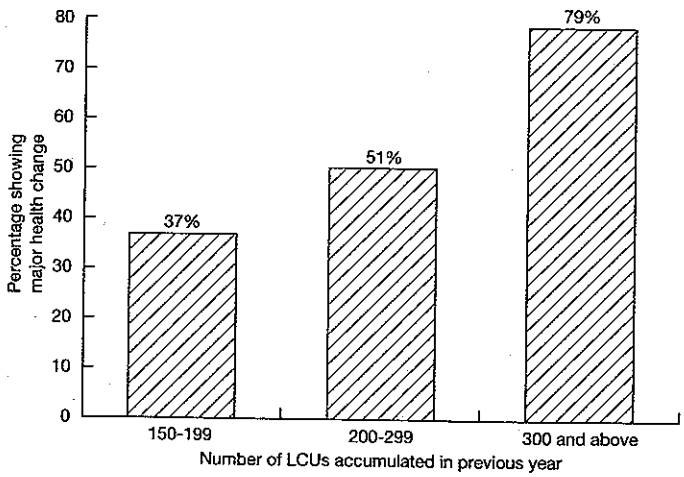

FIGURE 23-1 Relationship between life change units and illness.

overall findings of these studies (see Holmes & Masuda, 1974). In another study of 2,500 navy personnel, LCUs for the past 6 months were recorded using the SRRS, just prior to shipboard tours of duty. During the 6-month tour, those with fewer than 100 LCUs reported an average of 1.4 illnesses, those with between 300 and 400 averaged 1.9 illnesses, and those with between 500 and 600 suffered 2.1 illnesses (Rahe, Mahan, & Arthur, 1970). These and other studies over time have generally supported Holmes and Rahe's contention that the SRRS can predict illness. The findings reported here will also give you an idea of what your score on the scale means.

Think of your score (especially if it's high) as an important indicator of how stressful your life is and what impact your stress levels could have on your health. However, before you become too worried, several meaningful criticisms of the SRRS and its ability to predict illness need to be discussed.

CRITICISMS

Since Holmes and Rahe developed their SRRS, many researchers have expressed serious concerns about its accuracy and usefulness (see Taylor, 2002, for a review of these criticisms). One of the most widely expressed criticisms regards the inclusion of both positive and negative life events in the same scale, as well as events that are both in your control (events of choice, such as marriage) and events over which you have no control (such as the death of a friend). Research has demonstrated that certain events such as those that are sudden, negative, and out of your control are more predictive of illness than are positive, controllable life changes.

Others have maintained that the scale is flawed in that it does not take into account your *interpretation* of a particular event. For example, retirement for one person may mean an end of a career, being "forced out to pasture," while to another it is seen as an escape from drudgery into freedom. One researcher has suggested that a more accurate scale would be one that allows a person to check an event and also rate it on some measure of severity. Cohen, Kamarck, and Mermelstein, developed a scale designed to do this: the *Perceived Stress Scale* (1983).

In addition, the way the research has related the SRRS to illness has been questioned. When carefully analyzed statistically, the predictive relationship between your LCU score and illness is important, yet it is rather weak. In fact, SSRI scores account for only about 10% of the total variation among people who become ill. In other words, if you examine 1,000 people to see who becomes sick over a 6-month period, you will find great variation in the individual factors leading to their illness or lack of illness. If you have them all complete an SRRS, you will find that, considering all the possible reasons for health variation, their LCU scores explain about 10% of it. This is, nevertheless, a statistically significant correlation that confirms the ability of the SRRS to predict illness. However, it also says that many *other* factors are involved in illness. Another way to look at it is if you know someone's LCU score, your

chances of predicting the future of that person's health status are significantly better than if you did *not* have their score.

You might wonder why, if the SRRS has been so severely criticized, how can it be important enough to include in this book. That's a good question. Remember, some of the breakthroughs in the history of psychology were subsequently found to be lacking in some way, but that doesn't diminish the impact they had on our view of human behavior. This work of Holmes and Rahe, the SRRS, *in spite of* its limitations, continues to hold its place as a popular stress-research tool, 40 years after its inception.

RECENT APPLICATIONS

Although other tools for measuring stress have been, and are being, developed, the SRRS is still chosen frequently by researchers. As proof of the scale's ongoing popularity, an average of approximately 100 studies per year cite Holmes and Rahe's scale. This makes it one of the most often cited studies in this book. It is impossible to discuss here even a representative sampling of these studies, so brief mention will be made of several recent articles to convey the wide variety of research areas still making use of the SRRS.

One study incorporating the SRRS examined the relationship between life events and feelings of hopelessness (Haatainen et al., 2003). The researchers followed adults among the general population (without any diagnosed mental illness) over 2 years. Of those *who were not* feeling hopeless at the beginning of the 2 years, along with 56% of those *who were* experiencing hopelessness at the beginning of the 2 years, 4% reported hopelessness at the end of the 2-year period. The life events most responsible for either continuing or developing hopelessness were worsening of a participant's financial situation and interpersonal conflicts at work. However, the authors point out that positive changes in the participants' living situations appeared to *protect* them from becoming hopeless. (For more on this topic see Reading 31 on Seligman's study of learned helplessness.)).

A study comparing alcoholics with nonalcoholics adapted Holmes and Rahe's scale to examine the link between stress and alcohol abuse (Fouquereau et al., 2003). The participants were asked to contemplate imagined scenarios involving two life-change events versus a stressful social situation. Alcoholics and nonalcoholics rated the scenarios as equally stressful, but they rated the urge to drink alcohol in response to the situations very differently. "The nonalcoholics reported little stimulus to drink from any combination of items, whereas the alcoholics not only perceived the individual items as stimulating an urge to drink, but also used the same cognitive rule in judging the combined urge to drink as they used in judging the combined stress" (p. 669). The authors suggest that these findings may be important in helping recovering alcoholics to find ways of reducing stress in their lives and using strategies other than drinking for coping with stressful life events.

An important cross-cultural study questioned the validity of applying Western definitions and theories about stress to non-Western cultures (Laungani,

1996). Using India as an example, the author found that even the word *stress* itself does not translate well into other languages. He further contended that trying to overlay Western conceptualizations of stress, such as those tapped by the SRRS, onto other cultures, may not provide an accurate picture of the nature and experience of stress for much of the world's population. For example, people in *collectivist* cultures, such as India, China, or Israel, where the welfare of the larger social group takes precedence over the welfare of a single person, may experience less life stress differently or may perceive entirely different life events as stressful compared to Western "individualistic" cultures, such as the United States, where the SRRS was developed (for a more complete discussion of these cultural variations, see Reading 28 on Triandis's work).

Other applications of the SRRS in the study of human behavior include, but are not limited to, cigarette smoking, immune response, posttraumatic stress disorder, police officer burnout, child abuse, breast cancer, diabetes, medical school success, chronic illnesses, effects of war on spouses and children of deployed soldiers, HIV infection and AIDS, the psychological effects of natural disasters, divorce, and the aging process.

CONCLUSION

The relationship between stress and illness, although real, is complex and not a simple matter to study. Rahe himself has suggested that in addition to a simple LCU score, the following factors must be considered to predict psychosomatic illness:

1. How much experience you have had in the past with stressful events
2. Your coping skills; that is, your ability to psychologically defend yourself in times of life stress
3. The strength of your physiological systems (such as your immune system) to defend you against the life stress that you are unable to cope with psychologically
4. How you deal with illness when it does occur (such as practicing recuperative behaviors and seeking medical help)

Psychology and medicine professionals, working together, have recognized that virtually all illnesses contain a psychological component in how they develop, how they are treated, and how people recover. Clearly, the prevention and successful treatment of illness must involve the entire person: mind and body.

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Fouquereau, E., Fernandez, A., Mullet, E., & Sorum, P. (2003). Stress and the urge to drink. *Addictive Behaviors, 28,* 669–685.

Haatainen, K., Tanskanen, A., Kylmä J., Antikainen, R., Honkalampi, K., Koivumaa-Honkanen, H., Viinamäki, H., & Hintikka, J. (2003). Life events are important in the course of hopelessness—a 2-year follow-up study in a general population. *Social Psychiatry and Psychiatric Epidemiology, 38,* 436–441.

Holmes, T. H., & Masuda, M. (1974). Life change and illness susceptibility. In B. S. Dohrenwend & B. P. Dohrenwend (Eds.), *Stressful life events: Their nature and effects.* New York: Wiley.
Laungani, P. (1996). Cross-cultural investigations of stress: Conceptual and methodological considerations. *International Journal of Stress Management, 3*(1), 25–35.
Rahe, R. H., Mahan, J., & Arthur, R. (1970). Prediction of near-future health change from subjects' preceding life changes. *Journal of Psychosomatic Research, 14,* 401–406.
Taylor, S. (2005). *Health psychology,* 6th ed. New York: McGraw-Hill.

Reading 24: THOUGHTS OUT OF TUNE

Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology, 58,* 203–210.

Have you ever been in a position of having to do or say something that was contrary to your attitudes or private opinions? Chances are you have; everyone has at some time. When you behaved that way, what happened to your attitude or opinion? Nothing? Well, maybe nothing. However, studies have shown that in some cases, when your behavior is contrary to your attitude, your attitude will change to bring it into alignment with your behavior. For example, if a person is forced (say, by the demands of an experiment) to deliver a speech in support of a viewpoint or position opposed to his or her personal opinion, the speaker's attitudes will shift toward those given in the speech.

In the early 1950s, various studies tried to explain this opinion shift as a result of (a) mentally rehearsing the speech and (b) the process of trying to think of arguments in favor of the forced position. In performing those mental tasks, the early theories argued, participants convinced themselves of the position they were about to take. In pursuing this line of reasoning further, additional studies were conducted that offered monetary rewards to participants for giving convincing speeches contrary to their own views. It was expected that the greater the reward, the greater would be the resulting opinion change in the speaker. Seems logical, doesn't it? However, as one of many examples of how common sense is a poor predictor of human behavior, just the opposite was found to be true. Larger rewards produced *less* attitude change than smaller rewards. Based on behavioral theories of psychology that were popular at the time (e.g., operant conditioning, reinforcement theory, etc.), such findings were difficult for researchers to explain.

A few years later, Leon Festinger (1919–1989), a research psychologist at Stanford University, proposed the highly influential and now famous theory of *cognitive dissonance,* which could account for these seemingly discrepant findings. The word *cognitive* refers to mental processes, such as thoughts, ideas, attitudes, or beliefs; the word *dissonance* simply means "out of tune." Therefore, Festinger suggested, you will experience cognitive dissonance when you simultaneously hold two or more cognitions that are psychologically inconsistent. When this condition exists, it creates discomfort and stress to varying degrees, depending on the importance of the dissonance to your life. This discomfort then motivates you to change something to reduce the dissonance. Because

you cannot change your behavior (because you have already done it, or because the situational pressures are too great), you change your attitudes.

Festinger's theory grew out of an historical event involving rumors that spread throughout India following a 1934 earthquake there. In the areas outside the disaster zone, the rumors predicted that people should expect additional earthquakes of even greater proportions and throughout an even greater portion of the country. These rumors were untrue and lacked any rational foundation. Festinger wondered why people would spread such catastrophic and anxiety-increasing ideas. It occurred to him over time that perhaps the rumors were not anxiety increasing, but *anxiety justifying.* That is, these people were very frightened, even though they lived outside the danger area. This created *cognitive dissonance:* their cognition of intense fear was out of tune with the fact that they were, in reality, safe. Therefore, the people spread rumors of greater disasters to justify their fears and reduce their dissonance. Without realizing it, they made their view of the world fit with what they were feeling and how they were behaving.

THEORETICAL PROPOSITIONS

Festinger theorized that normally what you publicly state will be substantially the same as your private opinion or belief. Therefore, if you believe "X" but publicly state "not X," you will experience the discomfort of cognitive dissonance. However, if you know that the reasons for your statement of "not X" were clearly justified by pressures, promises of rewards, or threats of punishment, then your dissonance will be reduced or eliminated. Therefore—and this is the key—the more you view your inconsistent behavior to be of your own choosing, the greater will be your dissonance.

One way for you to reduce this unpleasant dissonance is to alter your opinion to bring it into agreement, or consonance, with your behavior. Festinger contended that changes in attitudes and opinions will be greatest when dissonance is large. Think about it for a moment. Suppose someone offers you a great deal of money to state, in public, specific views that are the opposite of your true views, and you agree to do so. Then suppose someone else makes the same request but offers you just a little money, and even though it hardly seems worth it, you agree anyway. In which case will your dissonance be the greatest? Logically, you would experience more dissonance in the less-money situation because you would feel insufficient justification for your attitude-discrepant behavior. Therefore, according to Festinger's theory, your private opinion would shift more in the little-money condition. Let's see how Festinger (with the help of his associate James Carlsmith) set about testing this theory.

METHOD

Imagine you are a university student enrolled in an introductory psychology course. One of your course requirements is to participate for 3 hours during the semester as a participant in psychology experiments. You check the bulletin

board that posts the various studies being carried out by professors and graduate students, and you sign up for one that lasts 2 hours and deals with "measures of performance." In Festinger and Carlsmith's study, as in many psychology experiments, the true purpose of the study cannot be revealed to the participants because this could bias their responses and invalidate the results. The group of participants in the original study consisted of 71 male, lower-division psychology students.

You arrive at the laboratory at the appointed time (here, the laboratory is nothing more than a room with chairs). You are told that this experiment takes a little over an hour, so it had to be scheduled for 2 hours. Because extra time will be available, the experimenter informs you that some people from the psychology department are interviewing participants about their experiences as participants, and he asks you to talk to them after participating. Then you are given your first task.

A tray containing 12 spools is placed in front of you. You are told to empty the tray onto the table, refill the tray with the spools, empty it again, refill it, and so on. You are to work with one hand and at your own speed. While the experimenter looks on with a stopwatch and takes notes, you do this over and over for 30 minutes. Then the tray is removed and you are given a board with 48 square pegs. Your task now is to turn each peg a quarter of a turn clockwise and to repeat this over and over for 30 minutes more! If this sounds incredibly boring to you, that was precisely the intention of the researchers. This part of the study was, in the authors' words, "intended to provide, for each participant uniformly, an experience about which he would have a somewhat negative opinion" (p. 205). Undoubtedly, you would agree that this objective was accomplished. Following completion of the tasks, the experiment really began.

The participants were randomly assigned to one of three conditions. In the control condition, the participants, after completing the tasks, were taken to another room where they were interviewed about their reactions to the experiment they had just completed. The rest of the participants were lured a little further into the experimental manipulations. Following the tasks, the experimenter spoke to them as if to explain the purpose of the study. He told each of them that they were among the participants in "group A," who performed the tasks with no prior information, while participants in "group B" always received descriptive information about the tasks prior to entering the lab. He went on to state that the information received by group B participants was that the tasks were fun and interesting and that this message was delivered by an undergraduate student posing as a participant who had already completed the tasks. It is important to keep in mind that none of this was true; it was a fabrication intended to make the next, crucial part of the study realistic and believable. This was, in other words, a cover story.

The experimenter then left the room for a few minutes. Upon returning, he continued to speak but now appeared somewhat confused and uncertain. He explained, a little embarrassed, that the undergraduate who usually

gives the information to group B participants had called in sick, that a participant from group B was waiting, and that they were having trouble finding someone to fill in for him. He then very politely asked the participant if he would be willing to join the experiment and be the one to inform the waiting participant.

The experimenter offered some of the participants a dollar each for their help, while others were offered $20 (a sizable amount of money in 1959). After a participant agreed, he was given a sheet of paper marked "For Group B" on which was written "It was very enjoyable, I had a lot of fun, I enjoyed myself, it was intriguing, it was exciting." The participant was then paid either $1 or $20 and taken into the waiting room to meet the incoming "participant." Participants were left alone in the waiting room for 2 minutes, after which time the experimenter returned, thanked them for their help, and led them to the interview room, where they were asked their opinions of the tasks exactly as had been asked of the participants in the control condition.

If this whole procedure seems a bit complicated, it really is not. The bottom line is that there were three groups of 20 participants each. One group received $1 each to lie about the tasks, one group was paid $20 each to lie about the tasks, and the control group did not lie at all.

RESULTS

The results of the study were reflected in how each of the participants actually felt about the boring tasks in the final interview phase of the study. They were asked to rate the experiment as follows:

1. *Were the tasks interesting and enjoyable?* This was measured on a scale of −5 (extremely dull and boring) to +5 (extremely interesting and enjoyable). The 0 point indicated that the tasks were neutral: neither interesting nor uninteresting.
2. *How much did you learn about your ability to perform such tasks?* Measured on a 0 to 10 scale, where 0 meant nothing learned and 10 meant a great deal learned.
3. *Do you believe the experiment and tasks were measuring anything important?* Measured on a 0 to 10 scale, where 0 meant no scientific value and 10 meant great scientific value.
4. *Would you have any desire to participate in another similar experiment?* Measured on a scale of −5 (definitely dislike to participate) to +5 (definitely like to participate), with 0 indicating neutral feelings.

The averages of the answers to the interview questions are presented in Table 24-1. Questions 1 and 4 were designed to address Festinger's theory of cognitive dissonance, and the differences indicated are clearly significant. Contrary to previous research interpretations in the field, and contrary to what most of us might expect using common sense, those

TABLE 24-1 Average Ratings on Interview Questions for Each Experimental Condition

QUESTION	CONTROL GROUP	$1 GROUP	$20 GROUP
1. How enjoyable tasks were (–5 to +5)*	−0.45	+1.35	−0.05
2. How much learned (0 to 10)	3.08	2.80	3.15
3. Scientific importance (0 to 10)	5.60	6.45	5.18
4. Participate in similar experiences (–5 to +5)*	−0.62	+1.20	−0.25

*Questions relevant to Festinger and Carlsmith's hypothesis (from p. 207.)

participants who were paid $1 for lying about the tasks were the ones who later reported liking the tasks more, compared to both those paid $20 to lie and those who did not lie. This finding is reflected both in the first direct question and also in the $1 group's greater willingness to participate in another similar experiment (question 4).

DISCUSSION

The theory of cognitive dissonance states, in Festinger's words:

1. If a person is induced to do or say something that is contrary to his private opinion, there will be a tendency for him to change his opinion to bring it into correspondence with what he has said or done.
2. The larger the pressure used to elicit the overt behavior, the weaker will be the above-mentioned tendency. (pp. 209–210)

Festinger and Carlsmith's findings clearly support this theory. Festinger's explanation for this was that when people engage in attitude-discrepant behavior (the lie) but have strong justification for doing so ($20), they will experience only a small amount of dissonance and, therefore, will not feel particularly motivated to make a change in their opinion. On the other hand, people who have insufficient justification ($1) for their attitude-discrepant behavior will experience greater levels of dissonance and will, therefore, alter their opinions more radically in order to reduce the resultant discomfort. The theory may be presented graphically as follows:

Atitude-discripant behavior → *Sufficient justification for behavior* → *Dissonance small* → *Attitude change small*

Attitude-discripant behavior → *Insufficient justification for behavior* → *Dissonance large* → *Attitude change large*

QUESTIONS AND CRITICISMS

Festinger himself anticipated that previous researchers whose theories were threatened by this new idea would attempt to criticize the findings and offer alternate explanations for them (such as mental rehearsal and thinking up better arguments, as discussed previously). To counter these criticisms, the sessions in which the participant lied to the incoming participant were recorded and rated by two independent judges who had no knowledge of which condition ($1 vs. $20) they were rating. Statistical analyses of these ratings showed no differences in the content or persuasiveness of the lies between the two groups. Therefore, the only apparent explanation remaining for the findings is what Festinger termed *cognitive dissonance.*

Over the years since cognitive dissonance was demonstrated by Festinger and Carlsmith, other researchers have refined—but not rejected—the theory. Many of these refinements were summarized by Cooper and Fazio (1984), who outlined four necessary steps for an attitude change to occur through cognitive dissonance. The first step is that the attitude-discrepant behavior must produce unwanted negative consequences. Festinger and Carlsmith's participants had to lie to fellow students and convince them to participate in a very boring experiment. This produced the required negative consequences. This also explains why when you compliment someone on their clothes even though you can't stand them, your attitude toward the clothes probably doesn't change.

The second step is that participants must feel personal responsibility for the negative consequences. This usually involves a choice. If you choose to behave in an attitude-discrepant way resulting in negative consequences, you will experience dissonance. However, if someone forces or coerces you to behave in that way, you will not feel personally responsible and you will experience little or no cognitive dissonance. Although Festinger and Carlsmith used the term *forced compliance* in the title of their article, the participants actually *believed* that their actions were voluntary.

Physiological arousal (the third step) is also a necessary component of the process of cognitive dissonance. Festinger believed that dissonance is an uncomfortable state of tension that motivates us to change our attitudes. Studies have shown that, indeed, when participants freely behave in attitude-discrepant ways, they experience physiological arousal. Festinger and Carlsmith did not measure this with their participants, but it is safe to assume that physiological arousal was present.

The fourth step requires that a person be aware that the arousal he or she is experiencing is caused by the attitude-discrepant behavior. The discomfort the participants felt in Festinger and Carlsmith's study would have been easily and clearly attributed to the fact that they knew they were lying about the experiment to a fellow student.

Festinger and Carlsmith's conceptualization of cognitive dissonance has become a widely accepted and well-documented psychological phenomenon. Most psychologists agree that two fundamental processes are responsible for changes in our opinions and attitudes. One is persuasion—when

other people actively work to convince us to change our views—and the other is cognitive dissonance.

RECENT APPLICATIONS

Social science research continues to rely on, demonstrate, and confirm Festinger and Carlsmith's theory and findings. One interesting study found that you may experience cognitive dissonance and change your attitude about an issue simply by *observing* people whom you like and respect engaging in attitude discrepant behavior, without any personal participation on your part at all (Norton et al., 2003). The authors referred to this process as *vicarious dissonance.* In Norton's study, college students heard speeches disagreeing with their attitudes on a controversial issue (a college fee increase). For some, the speech in favor of the increase was given by a member of their own college (their "ingroup"), while for others, the speech was made by a member of another college (their "outgroup"). When an ingroup member delivered the speech, the participants experienced cognitive dissonance and decreased their negative attitudes toward the increase. In an even stronger demonstration of vicarious dissonance, the researchers found that the participants did not even have to hear the speech itself; simply *knowing* that the ingroup member agreed to make the speech created enough dissonance to cause the attitude change.

A fascinating study in a different vein used the theory of cognitive dissonance to explain why some cigarette smokers refuse to quit even though they know (as does nearly everyone) the negative health effects of smoking (Peretti-Watel et al., 2007). If you smoke cigarettes, knowing the risk to your health, and feel unable to quit, you will likely experience cognitive dissonance. Because this is an unpleasant state, you will develop strategies that will reduce your dissonance. In this 2007 study, the researchers found that smokers often expressed "self-exempting" beliefs along the lines of "Smoking is dangerous to people's health but not to me because I don't smoke very much" or "The way I smoke cigarettes will protect me from disease." The researchers suggest that "Future tobacco control messages and interventions should specifically address these self-exempting beliefs that reduce smokers' cognitive dissonance and then inhibit their willingness to quit" (p. 377).

Very important research based on Festinger's theory of cognitive dissonance, conducted by the psychologist Elliot Aronson at the University of California, Santa Cruz, focused on changing students' risky sexual behaviors (Shea, 1997). Sexually active students were asked to make videotapes about how condom use can reduce the risk of HIV infection. After making the tapes, half of the students were divided into groups and encouraged to discuss why college students resist using condoms and to reveal their own experiences of not using condoms. In other words, these participants had to admit that they did not always adhere to the message they had just promoted in the videos; they had to face their own hypocrisy. The other students who engaged in making the videos did not participate in the follow-up discussions. When all the students were then given the opportunity to buy condoms, a significantly higher

proportion of those in the hypocrisy group purchased them compared to the video-only group. More importantly, 3 months later, when the participants were interviewed about their sexual practices, 92% of the students in the hypocrisy group said they had been using condoms every time they had intercourse compared to only 55% of those who participated in making the videotapes but were not required to publicly admit their attitude-discrepant behavior. This is a clear example of cognitive dissonance at work.

CONCLUSION

When you are forced to confront the discrepancy between your beliefs and your behavior, you will usually experience cognitive dissonance that will motivate you to change either your behavior or your beliefs to bring them more "in tune" with each other. Elliot Aronson, a strong proponent of the importance of cognitive dissonance in bringing about real-life behavioral change, explains that "Most of us engage in hypocritical behavior all the time, because we can blind ourselves to it. But if someone comes along and forces you to look at it, you can no longer shrug it off" (Shea, 1997, p. A15).

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