

asgn4r -- MOTIVATION: Sexual Motivation

Sexual motivation is very powerful. It must be, because it must at some time overwhelm all other motivations. If it doesn't, the species will die out. The strength of different motivations has been compared by testing how intense an electric shock a rat will overcome to get to different goals. The strongest goals were access to a sexually receptive female (for a male), access to her own young rat pups (for a female) and electrical brain stimulation that directly activates the "reward system" of the brain.

Many people think a strong interest in sex reflects an "inferior animal nature." Actually, humans (and our closest relatives, chimpanzees) are the "sexiest"

animal species. Almost all species copulate ("have sex") only when the female is in estrus (receptive; in heat). In contrast, humans and chimpanzees copulate at any time during the female's sexual cycle.

The sexual cycle does still have an effect. Women report increased sexual interest and activity near the time of ovulation, which is when other animals go into heat. They also report more sexual fantasies and an increased preference for more masculine faces. Women who use birth control pills, which work by altering the hormone balance, do not have this peak in sexual interest. (Adams et al., 1978). [Link to an article summarizing these findings.](#)

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- Q1.** Human sexual behavior *differs* from sexual behavior of (almost) all other species in that
- A. humans will not tolerate much pain to get to a sex partner
 - B. humans are sexually active throughout the female's sexual cycle
 - C. human females are more interested in sex about when they can get pregnant
 - D. birth control pills make the sex drive stronger to compensate for the suppressed ability to get pregnant
 - E. B, C, and D are all correct
 - F. A, B, C, and D are all correct
-

Getting reliable information on human sexual behavior is quite difficult because many people are uncomfortable talking about sexual behavior, their own in particular. Even with good interview methods, many people are likely under-report or over-report sexual activity for various reasons. Nevertheless, much of what is known about human sexual behavior is based on surveys and interviews sampling many different populations, a method the Alfred Kinsey first used. He obtained what is still the largest and most detailed collection of sexual histories, mostly from 1938 to 1948.

Kinsey was an internationally known evolutionary biologist, elected to the National Academy of Sciences (the most prestigious scientific organization in the US) for his work on variation in gall wasps populations, which he used to test hypotheses about evolutionary theory. His interest in human sexual behavior was the result of teaching. He agreed to coordinate a course on marriage and the family for undergraduates here at Indiana University. He himself taught the section on the biology of sex. He discovered that the scientific literature on human sexual biology and behavior was almost nonexistent. Therefore, he set out to get information, first by interviewing students in his class and then from people from all walks of life.

Kinsey successfully recruited respondents ranging from church groups and Rotary Clubs to prostitutes and convicts. He usually asked for, and usually got, 100% cooperation from the groups he recruited, illustrating his exceptional persuasive powers (except in fund raising).

Kinsey did not get a random sample of the population. This was the major criticism he faced from the scientific community. But this was not his primary goal. As in his work on gall wasps, the range of individual variation was his main interest. He wanted to describe the full range of human sexual behavior, so he sampled exceptional groups more than their relative frequency in the population and tried to correct for the over-representation statistically. It makes little difference whether 5% or 10% of the population is exclusively homosexual in orientation. What was important for Kinsey was that a substantial fraction of the population engaged in sexual behaviors that most people thought was rare.

Kinsey developed effective interview methods for getting accurate reports. He personally did about half of the 18,000 interviews, and one colleague did most of the rest. He taught himself and his interviewers to be completely neutral and unresponsive to anything the respondent (person reporting) said. They always treated their respondents with consideration and courtesy, and they were careful to ensure privacy of both the interview itself and the data. These features of the interview were very helpful in getting histories from socially deviant populations (e.g., prisoners, prostitutes, members of the homosexual community, which was then very much "underground").

The questions always assumed that the respondent (person being interviewed) had done the behavior (e.g., when did you first have extramarital sex). This form of questioning makes it easier for respondents

to admit activities they felt uncomfortable talking about. The interviewers learned and used the vocabulary of the respondent, which prevented

confusion and helped establish rapport (good relations) with the respondent.

Q2. Kinsey's interview method

- A. used interviewers trained not to react to anything the respondent (person responding) said.
 - B. used questions that assumed the respondent had done sexual behaviors, so s/he did not have to admit to doing a sexual behavior (Questions asked "When did you first .." rather than "Have you ever ..").
 - C. asked questions using the language the respondent normally used about sex
 - D. did not use a random or representative sample
 - E. A, B, C, and D are all correct
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A recent survey (Laumann et al., 1994) claims to have a more representative sample. *This survey reports lower frequencies of homosexual and extramarital sexual activity than Kinsey found* in a socially and sexually much more restrictive time. The sample consisted of an English-speaking person from a representative sample of more than 3,000 households. The sample included only people between 18 and 59, and excluded people in prison or a hospital or away from home at college or in the military.

terms were defined the first time they were used. The interviews were held in the respondents' homes, which often prevented strict confidentiality. This method of interviewing is quite different from Kinsey's, so it is not too surprising that the numbers came out differently. It almost certainly underestimates the frequency of many sexual behaviors, especially ones that society labels as deviant or immoral. Specifically, the lack of complete privacy, the exclusion of people not living at home, the use of standard English, and the limited experience of the interviewers almost certainly resulted in under-reporting. Furthermore, their selection process excluded many of the most sexually active people.

The interviewers received at least three days of training and succeeded in getting standard 90-minute interviews from 80% of the selected households. The questions were in "standard English," and sexual

Q3. Compared to Kinsey's interview method, the recent survey of sexual behavior by Laumann et al. (1994)

- A. probably had a more representative sample of a specified part of the population
 - B. was not very careful to ensure that respondent felt the interviews were really private or that they understood the questions.
 - C. was less likely to get a full and accurate report of respondents' sexual experience
 - D. probably missed many of the more deviant and extreme forms of sexual behavior
 - E. all of the above are correct
-

The one thing constant about human sexual behavior is its variability. Cultural, social, psychological, and physiological factors all contribute to produce this variability. Some cultures tightly restrict sexual activity; Others view it casually. In some cultures sexual activity is quite infrequent, even for young married couples. In others, some people report sexual activity several times a day.

Nevertheless, all cultures and all social groups have some form of regulation of sexual behavior. The range of sexual behaviors that are acceptable also vary widely. Overall, American society appears to have changed greatly in attitudes about sexual behavior. Certainly many people talk much more openly about sex. Although accurate estimates are difficult to obtain, it is obvious that premarital and extramarital sexual activity is greater now than in the mid-20th century when Kinsey published the survey results. On the other hand, in the 1990's the Surgeon General of the United States was forced to resign because, among other controversial statements, she proposed to encourage masturbation as an alternative sexual outlet to premarital sex.

In American society, people differ widely in frequency of sexual activity, range of sexual behaviors, number of sexual partners, and almost any other variable you can think of. So defining "normal" sex practices is difficult. Many people define what is normal on moral, rather than scientific, grounds.

Q5. Normal sexual behavior is hard to define because ___.

- A. sexual behavior is basically abnormal
 - B. people spend little time "having sex"
 - C. A & B are both correct
 - D. sexual interest and activity normally vary a lot among individuals, even within the same social groups
 - E. None of the above. Normal sexual behavior is intended for reproduction, so anything that does not help reproduction is abnormal.
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There are clear gender differences in some aspects of sexual activity.

For example, males are much more likely to masturbate, are more likely to have premarital and extramarital sexual intercourse, think more different sex partners are desirable, and are more likely to seek sexual intercourse after short acquaintance with a new partner.

Buss (1994) has proposed that gender differences do exist in several aspects of human reproductive behavior, because males and females have different reproductive strategy. A female can produce few children in her reproductive lifetime and must invest a lot of effort into raising them. Therefore, a female increases her reproductive success if she can get support from the man who fathered her children. A male, on the other hand can father many children by different females. Therefore, he can maximize his reproductive success by mating with several women.

Buss and colleagues have done cross-cultural surveys, which support several predictions from this model. For example, males put a higher emphasis on physical attractiveness in their marriage partners, which is supposed to be a sign of high reproductive capacity. Females rate social status higher, because a male of higher social status is more likely to provide better for her children. For the same reasons, males prefer younger women and females prefer older men as marriage partners.

Men are more concerned about their wives' sexual infidelity, because this makes their paternity uncertain. Women are more concerned about their husbands' having a close social relationship with another woman, because it carries the threat of losing support for her children.

Buss's survey results are quite robust (easily reproduced). Figures 1-4r and 2-4r show data collected from two classes a few years ago on the importance of physical attractiveness and social status for males and females. The class responses to these and several other questions confirm the differences Buss found. Of course, a social account of these gender differences is as reasonable (Eagly & Woods, 1999).

Evolutionary and social accounts of gender differences in sexual attitudes and behavior complement each other. As the exercises on behavior genetics (asgn1q and r) point out repeatedly, *heredity, which is what evolution works on, requires an environment to work, and environmental effects must work on a genetic product: evolutionary and social explanations are complementary, not competitive.* Evolution shapes

"predispositions" and social processes may shape how those "predispositions" are expressed.

Gender differences appear in other aspects of sexual behavior. Females are less likely to have premarital or extramarital sexual relations than men are. They also prefer to wait longer after knowing a potential partner before participating in sexual activity. Some studies report gender differences the kind of stimuli that are sexually arousing. Males are aroused by sensory stimuli (which is why Playboy-type centerfolds are so popular). Females seem to respond more to romantic situations (affection, kissing, etc.). In contrast to these differences, males and females report imagery about sexual activity that are quite similar (replacing their regular partners, having a forced encounter, observing sexual activity, etc.).

Figure 1-4r. Sex differences in importance of physical attractiveness for a long term partner.

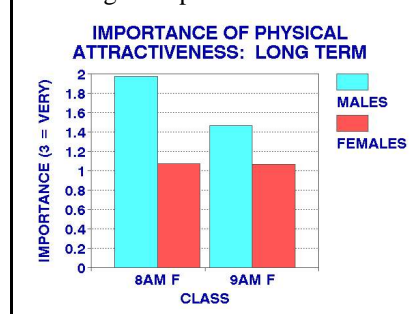
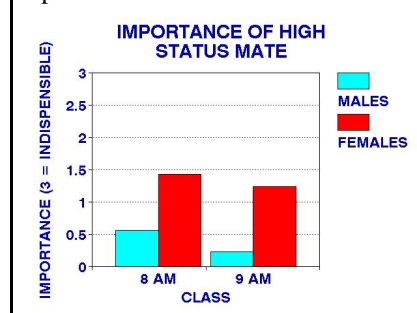


Figure 2-4r. Sex differences in importance of mates' social status.



Q6. Males and females are the most *similar* in

- A.** the arousing effects of naked bodies of the opposite sex
- B.** wanting physically attractive spouses
- C.** how much of their behavior is socially dependent and how much depends on evolutionary adaptation
- D.** the amount of extramarital sexual activity
- E.** their sexual fantasies
- F.** A, B, & C are all correct

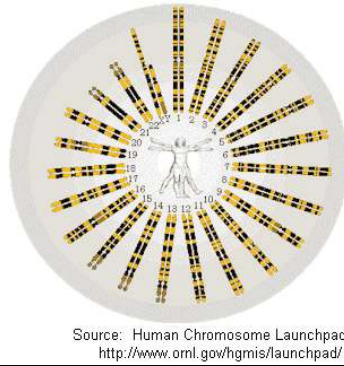
[Link to an article about a new model of the processes involved in sexual arousal.](#) [Link to a slide show summarizing the new model!](#) [Link to a news release about the effects of mens' cologne on sexual arousal in women.](#) [Link to course material about hormones and sexual behavior.](#)

asgn4s -- MOTIVATION: Development of Sexual Motivation

Sexual behavior is studied at many levels: genetic, physiological, behavioral, psychological, social, cultural. All levels interact to produce the pattern of sexual behavior an individual shows.

Chromosomes are the structures in cells that carry the genes; each carries many thousand genes. Like genes, chromosomes come in pairs. An infant receives one of each chromosome pair from each parent. Humans have 23 pairs of chromosomes; mice have 20 pairs; dogs have 39 pairs. Figure 1-4s is a diagram of the 23 pairs of chromosomes in humans. Each chromosome pair has a characteristic pattern of dark-staining bands.

Figure 1-4s. Diagram showing the 23 pairs of chromosomes that humans have



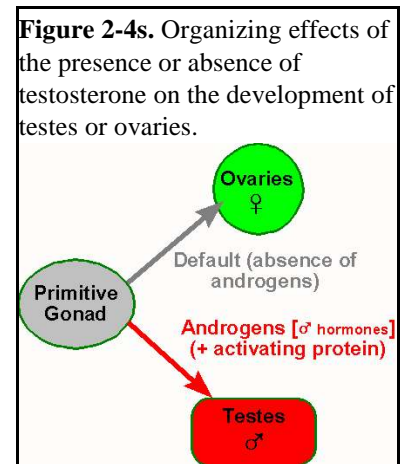
genes on one pair of chromosomes determine genetic sex. In mammals, including humans, females have two **X chromosomes**, and males have an X chromosome and a **Y chromosome**. A baby's genetic sex is determined at conception by the type of sperm that fertilizes the ovum. Figure 1-4s shows that in the XY [23rd] pair, the X chromosome is much longer than the Y chromosome.

Paternal genes determine genetic sex. The mother provides an X chromosome (the only kind she has) in her ovum (egg), and the father provides an X or a Y chromosome in each sperm cell. If an X-carrying sperm fertilizes the ovum, the child has the female **genotype** (is genetically female); if a Y-carrying sperm fertilizes the ovum, the child has the male genotype (see asgn1q). So the male sex cell determines the genetic sex of the fetus. (The genetics of sex determination turns out to be considerably more complex. [Link to a short news release about other genetic processes.](#))

- Q1.** Figure 1-4s is a diagram of the 23 pairs of chromosomes of a human. This person is
- A. a genetic *female*, because it has an X and a Y chromosome in the 23rd pair.
 - B. a genetic *male*, because it has an X and a Y chromosome in the 23rd pair.
 - C. a genetic *female*, because it has two X chromosomes in the 23rd pair.
 - D. a genetic *male*, because it has two X chromosomes in the 23rd pair.
 - E. has a genetic error because the X and Y chromosomes in the 23rd pair are unequal in length, leaving some genes unpaired.

Male hormones -- **androgens**, especially **testosterone** and female hormones -- **estrogen** and **progesterone** -- have very strong effects on sexual behavior. These hormones have two general effects: **organizing** and **activating**.

The organizing effect pushes the embryo (a very early stage of prenatal development) to develop a male or a female **phenotype** (observable form). The organizing effects of sex hormones begin very early in development, a few weeks after conception. The gonads (sex glands) start undifferentiated (~thesame) in males and females. They develop into male testes or female ovaries, depending whether testosterone and (its metabolic products) are absent or present. Figure 2-4s summarizes testosterone's organizing effects on the development of ovaries or testes from the undifferentiated, primitive gonads. Organizing effects continue to operate well after birth, [perhaps even through puberty.](#) ([Link to an article on human sex chromosomes and their abnormalities.](#))



The organizing effects of sex hormones are obvious on the body. However, until about 25 years ago, sex differences in brain structure were virtually unknown, primarily because researchers did not look for them. Once researchers did look, they found brain differences between males and females in several areas. One is so obvious that you can tell a male rat brain from a female by looking at a stained slice of the brain with the naked eye (no microscope). Males have a large nucleus (cluster of neurons) in the hypothalamus that is very small in females.

In addition, sex differences in structure and function have been identified in rats, monkeys, and humans. For example, Kimura (1992) has documented mean ("average") differences favoring women on tests of perceptual speed, verbal fluency, precision manual tasks, and arithmetic calculations. She found mean differences favoring men on tests of spatial

perception and imagery, target-directed motor skills like catching a ball, finding hidden shapes, and in mathematical reasoning. Note that these are mean differences. The distributions of scores have large standard deviations (they vary around the mean a lot) and large overlaps between men and women. Link to [a news article about differences between the average female and male brains](#). Link to an [article on the role of estrogen in memory](#).

The activating effects of the sex hormones turn on adult sexual function and behavior around the time of puberty. They induce the secondary sex characteristics and dramatically increase interest in sexual activity, which appears at puberty. They do so by activating brain circuits previously developed by the organizing effects of testosterone's presence or absence.

Match the following:

- | | |
|--|---|
| 1. chromosome contributed only by father | 2. chromosome contributed by mother (to all her children) |
| 3. made James interested in girls when he was about 12 | 4. Julia Roberts |
| 6. made Costner and Roberts develop differently after conception | 5. Kevin Costner |
| Q2A. organizing effect of testosterone | Q2B. X chromosome |
| Q2C. Y chromosome | Q2D. XX phenotype |
| Q2E. XY phenotype | Q2F. activating effects of sex hormones |

Laboratory experiments with developing animals, mostly laboratory rats, permit a much more detailed study of behavioral effects of the early hormonal environment. Genetic males normally start producing a small amount of androgen very early in development, whereas genetic females normally do not. Experimental studies varied effective levels of androgen very early in prenatal development. These studies showed that androgen produces a male phenotype, regardless of the animal's genetic sex. These experiments also showed that absence of androgen produces a female phenotype, regardless of the animal's genetic sex.

Perinatal (around the time of birth) hormone treatment has little effect on most anatomical sex differences, but it can strongly affect brain organization and behavior. Females that got androgen around the time they were born are masculinized (show increased male-typical

behaviors). In the same way, removal of androgens around birth de-masculinizes (show less male-typical behaviors) male rats. For example, masculinized female rats will as adults mount (start sexual activity with) other females. Absence of androgens makes male rats' behaviors less masculine. For example, as adults they mount females less than average (Gerall et al., 1967).

Humans also show the effects of exposure to sex hormones during early development. For example, a synthetic hormone sometimes used to prevent spontaneous abortions during pregnancy has androgen-like effects. Female children of such pregnancies show more masculine traits than their sisters who were not exposed to that hormone. They show more "tomboy" traits: they are less interested in clothing and girl-typical activities and more interested in rough and tumble male-typical activities (Reinisch, 1974; Reinisch et al., 1991).

Q3. An embryo (very early stage of development) with XX chromosomes is exposed to testosterone. This produces _____. A fetus (later stage of development before birth) with XX chromosomes is exposed to testosterone. This produces _____.

- A. a genetic female that looks and acts male; a female that has more male-typical behaviors than usual
- B. a genetic female that looks and acts female; a female that has more female-typical behaviors than usual
- C. a genetic male that looks and acts female; a male that has more female-typical behaviors than usual
- D. a genetic male that looks and acts female; a male that has more male-typical behaviors than usual

The activating effects of sex hormones begin at or even before puberty (sexual maturity). The body increases production of sex hormones, which induces the secondary sex characteristics (voice, body shape, body hair) and activates sexual functioning. The increased levels of hormones also greatly increase interest in sexual activity, which began to develop a few years earlier due to secretion of androgen from the adrenal glands. This is the sex hormones' activating effect. For males, increased androgen secreted from the testes serves as the activating hormone. Except in humans and chimpanzees, estrogen is the activating hormone for females.

Human and chimpanzee females are different. Besides the estrogens, which activate female sexual activity in other species, androgen serve as an activating hormone for females as well as males. These androgens are secreted in small quantities from the cortex (outer layer) of the adrenal glands.

Recent research (McClintock & Herdt, 1996) shows that sexual interests begin to develop in children at about age 10, considerably before puberty. This interest is associated with increasing production of androgen by the adrenal glands (rather than the gonads [sex glands: ovaries & testes]).

Q4. Human sex drive *differs* from other animals because testosterone is

- A.** the activating hormone in males **B.** together with estrogen, the activating hormone in males
C. the activating hormone in females **D.** together with estrogen, the activating hormone in females
-

The activating hormones appear affect behavior by changing incentive motivation. They appear to make stimuli associated with sexual behavior much more interesting and attractive, so that behavior is directed toward them more. If hormones are not present during puberty, sexual interest remains minimal. If

("fixed") as adults, sexually inexperienced males quickly lose interest in sexual activity. Castration's effect on experienced males' sexual activity is considerably slower, suggesting that experience strengthens the brain's system for sexual activity.

Q5. The decline in sexual activity in males following castration

- A.** decreases the attractiveness of the opportunity for sexual activity
B. decreases more slowly in experienced than inexperienced males
C. reflects the loss of the activating effects of testosterone
D. all of the above are correct
-

Social factors are also important in the development and expression of sexual behavior and identity (how clearly individuals think of themselves as male or female). Males and females are treated differently almost from birth. In one study a toddler dressed in sex-neutral clothing was given a male or a female name. The male name induced more direct and vigorous play from adults.

case. One of a pair of identical twins suffered an accidental mutilation of his penis. Because of this accident, he received a sex change operation and hormone treatment to make him female, and his parents treated him as a girl. He responded by becoming quite feminine in his behavior, whereas his twin brother remained, as expected, masculine in his gender identity.

Throughout development, societies treat male and female children differently as they attempt to shape the children to fit into the socially defined adult male and female roles. These social effects are claimed to be quite powerful, but normally genetic, hormonal, and social sex-determining factors work together during development to produce normally functioning male and female adults. In a few cases, however, socially assigned gender did not match genetic and hormonal sex of the individual. Such sexual mis-assignment (treating male babies as female or vice versa) has been claimed to overcome genetic and hormonal sex.

However at age 14 the surgically treated twin insisted on being returned to male gender identity (Diamond, 1997a, 1997b). This observation raises questions about the conclusion that social factors can override genetic and hormonal factors in the development of gender identity. Link to [an article about this case.](#) [Link to a short article that summarizes a much larger study](#) with a similar finding.

Evidence on how effective and how permanent social reversal of sex roles has changed. Money and Ehrhardt (1972) described a particularly interesting

A much larger "natural experiment" also shows that boys treated as girls during childhood revert to male gender identity and sexual orientation when they reach puberty (Imperato-McGinley et al., 1974). In a small community in the Dominican Republic, some baby boys have at birth what appear to be both male and female external sex organs: they are *pseudo-hermaphroditic* (pseudo = false; hermaphrodite =

having sex organs of both sexes). Their parents bring up these baby boys as girls until puberty. Then their male genetic and hormonal sex becomes apparent, and their gender identity becomes masculine.

At least two factors encourage this gender role switch. First, this switch is not uncommon in this small community, so these pseudohermaphroditic children may be treated differently than real girls are. Second, in this culture, male children are more valued than are female children.

Gender differences appear very early in life, and they are not easy to modify. Little boys usually prefer stereotypic masculine toys (e.g., guns and trucks) and little girls usually prefer stereotypic feminine toys (dolls and household items). A recent study describes gender stereotypic preferences for musical instruments among kindergarten-aged children (Pickering & Repacholi, 2001). Boys strongly prefer drums, trumpets, and saxophones; whereas girls prefer violins, clarinets, and flutes. Girls' preferences are more flexible. In fourth grade they select male-stereotypic instruments far more than kindergarten-aged girls. Fourth grade boys show little change. [Link to a summary of this article.](#)

Q6. Socially defined gender identity

- A. has no effect on sexual behavior and identity B. overrides hormonal and genetic sex
 C. produces homosexuality if it is opposite to genetic and hormonal effects on sexual development
 D. normally matches genetic and hormonal effects on sexual development E. B, C, and D are all correct

Homosexuality is the sexual attraction for a person of the same sex. Attitudes toward homosexuality vary widely among cultures and social groups. Some cultures are tolerant of it in various degrees, and some even consider it a normal phase of sexual development. Many other cultures punish homosexual behavior far more harshly than the US and England, two traditionally "homophobic" countries.

Homosexuality was considered a form of psychopathology in the U. S. until the 1970's when social and legal opinion about homosexuality gradually began to change. More people acknowledged their homosexuality and rejected the idea that homosexuality reflected psychological pathology. Eventually the panel of the psychiatric profession responsible for defining and coding psychological abnormalities removed homosexuality from the list. Most states have removed legal sanctions against homosexuality among consenting adults, but a large fraction of the general population still believes that it represents some sort of pathology and/or immorality.

The origins of homosexuality remain unclear despite much research, but it is very likely that genetic, hormonal, environmental, and situational factors are all involved. Homosexuality occurs in all walks of life, as a controversial early sociological study showed (Humphrey, 1966).

Some factors that some people have assumed were important have turned out to have little or no effect. Homosexuality is not particularly associated with any form of child rearing practices or abnormally low levels of the appropriate sex hormones. Male and female homosexuals show patterns of sexual interest and behavior much like those of heterosexuals, except for the object of sexual attraction. For example, administration of testosterone to male homosexuals increases sexual interest -- directed at males. Some male homosexual behavior reflects the absence of opportunity for heterosexual activity, as happens in prisons and in the military or with men whose spouses refuse sexual activity (Humphrey, 1966).

Genetic factors and the environmental conditions that may activate them. Twin studies suggest that a genetic factor contributes to homosexuality. Monozygotic (identical) twins are more concordant for (more likely to match) in sexual orientation than are dizygotic (fraternal) twins. Nevertheless, the correlation is well below 1.00, so environmental factors must also contribute. One environmental factor may be maternal stress during pregnancy. Mothers of homosexual men report more stress during that pregnancy than for pregnancies that produced children who developed heterosexually. Studies on rats show that mother's stress can increase female-typical behavior in her male rat pups (Ward, 1972).

Q7. Male homosexual behavior appears to be related to

- A. exposing male fetuses to excess estrogen during pregnancy B. overprotecting boys during childhood
 C. a genetic factor D. environmental factors, perhaps stress hormones, before birth
 E. lack of available heterosexual outlets. F. C, D, and E have been proposed

Brain systems in homosexuality. As noted above some sex-related areas of the hypothalamus differ in size between males and females. Some of these areas may be intermediate between male and female in the brains of homosexual and transsexual males. Transsexual males (this condition is much more frequent among males) feel that they are females trapped in a female body. In contrast homosexuals maintain their sexual identity as males [or females] but are sexually attracted to the same [homo] sex.

Other parts of the hypothalamus are even larger than in heterosexual males (Swaab & Hofman, 1995). The meaning of these observations is not clear, because they are correlations. The observed size differences in these brain areas may contribute to the development of homosexuality or transsexuality, or they may reflect the result of differences in sexual activity between heterosexual and homosexual males.

Q8. Male homosexual behavior

A. is caused by abnormalities in the hypothalamic system that organizes sexual behavior.

B. may be associated with abnormal size of brain areas that differ between heterosexual females and males.

C. hypothalamic genes for homosexual behavior.

D. A, B, and C are all correct.

[In a previous semester someone criticized the following as a scare tactic. Its intent is not to scare, but to inform. You may decide for yourself whether to be scared or not. The information is, to the best of my knowledge, accurate, and it is not intended to be biased toward a particular view on the morality or ethics of sexual behavior.] Sexually transmitted diseases are an important public health problem. AIDS gets all the publicity, but syphilis and gonorrhea are returning as significant public health problems. Gonorrhea and syphilis have a long history, and one of the great successes of antibiotic therapy was in the treatment of these bacterial diseases. The reemerging forms of these diseases are especially contagious and have evolved resistance to most antibiotics.

AIDS is a "new" disease first identified in the late '70s. A class of viruses called HIV were soon identified as the infectious agent. Although a few scientists -- not active in AIDS research -- have repeatedly raised doubts about HIV's role, the evidence strongly indicates that HIV infection is necessary for AIDS to develop.

The problem of AIDS is not restricted to the male homosexual community, though it has been far more severe in that group than in others. It is not "someone else's problem." It and other sexually transmitted diseases are a potential problem for every sexually active individual. Sexually transmitted disease is completely preventable. Sexual abstinence protects (almost) completely. However,

many people will not find that acceptable. A very safe solution is mutual monogamy: both people in a couple have only the other as a sex partner. These two were the traditional codes of sexual behavior, and nominally (what people say) it is still the standard. But people have never lived up to this code entirely. Benjamin Franklin, the great patriot whose face is on the \$100 bill, was famous for entertaining the ladies in Paris when he was ambassador to France during the War for Independence. He did not restrict his entertainment to his famous wit.

People who have multiple sex partners may believe that the "right kind" (meaning their kind) of people don't get exposed to sexually transmitted diseases, because they also have sex with the "right kind" of people. Unfortunately, this is largely an illusion. Most social groups will contain members whose sexual practices put them at risk. People can decrease their risk considerable by using condoms with spermicide. Unfortunately, condoms do break, get punctured, or slip off during sexual activity. And in the excitement of a sexual encounter, especially an "unexpected" one, using a condom is not the first thing that comes to mind.

These diseases can also be transmitted by blood that gets through the skin, usually by sharing non-sterile needles when injecting recreational drugs. This route of transmission has been decreased with some success by offering needle exchanges to heroin addicts.

[Link to the Kinsey Institute's information site.](#) [Link to the National Institutes of Health site with sources of information about AIDS/HIV.](#) [Link to a summary of current research on AIDS.](#)

asgn4t -- MOTIVATION: Social Motivation

More than a half century ago, Henry Murray (1938) proposed a list of 27 social motives, which he believed all people had in different degrees. We really don't know whether there are 27 (or 7 or 47) social motives. But that's not very important. We will find out the kind and number of social motives as we gain a better understanding of social motivation in general. Murray's list is important because it got researchers to study social motives directly in controlled conditions.

Only a few have been studied much. Of the social motives on Murray's list, **need for achievement (N_Ach)** has received the most attention, mainly through the work of David McClelland and co-workers (e.g., McClelland et al., 1976). Need for achievement is particularly interesting because McClelland and others have shown it is strongly related to an important practical aspect of modern life: entrepreneurship (~business skill) and the associated economic development (McClelland, 1961; McClelland & Winter, 1969).

McClelland defined need for achievement as seeking "success in competition with some standard of success" (McClelland et al., 1953). People with a high need for achievement try to do tasks well and quickly, if they see efficient completion of the task as reflecting their abilities. In addition, they need feedback about their success promptly: the quarterly sales report, rather than the 5-year trend of sales.

A task that anyone can do fairly well, like counting the number of words in each paragraph of this exercise, is not one they will strive to do especially well. In contrast, they are likely to strive to do well on tasks like solving anagrams (unscrambling a set of letters to form a word [uismc = music]) or building enough "rockets" with Tinkertoy parts in five minutes to meet their prior estimate of how many they can build. Such tasks require skills and efficient strategies. Therefore, success on them gives people with a high need for achievement a satisfying sense of accomplishment and shows off their abilities to others. Furthermore, they know promptly how well they did..

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- Q1.** Hector fills in for all kinds of jobs at the supermarket where he works. He scores high on need for achievement. You may expect him to work the hardest and do the best job at
- | | |
|---|--|
| A. checking and weighing produce for customers | B. stacking cans on the groceries |
| C. preparing work schedules that minimize time and maximize efficiency | D. counting money in the cash drawers |
| E. doing inventory | |
-

A person's need for achievement (and other social motives) can be measured in several ways. McClelland and co-workers developed the **Thematic Apperception Test (TAT)** for this purpose. This test asks the participant to write a story about a series of pictures showing one or a few people. It's unclear what's happening, except from some context information. For example, one picture shows a man sitting at a desk with papers in front of him, apparently late at night, as in Figure 1-4t.

The pictures provide little information about what might be happening. Therefore, the story a person tells about the picture is supposed to reflect what s/he thinks is interesting and important, which must reflect his/her motives. The stories can be scored quite reliably; different trained raters will score the same stories very similarly. The scoring is objective enough that a computer program can do it.

Social motivations can be activated by environmental information. Need for achievement can be activated

Figure 1-4T. The kind of scene that pictures for the TAT test present.



simply by having people read a list of achievement-related words. Everyday circumstances will activate

specific social motives. For example, a person who takes the TAT test early in April and hasn't done his taxes may very well write a story about doing a tax

return in response to Figure 1, because getting the taxes done is probably quite important to that person at that time.

Q2. The Thematic Apperception Test is based on this idea: The stories people tell in response to the stimulus pictures reflect

A. what s/he knows about social motivations

B. how many social motives s/he has

C. what motivates or is motivating him/her

D. what s/he has learned to associate with drive reduction

E. which social motive the picture triggers

The following might be what a man with a high need for achievement might write in response to a picture like Figure 1-4T:

This man is working late on a proposal for reorganizing the department he works in. He thinks it will improve efficiency and customer satisfaction. He plans to show it to his department head the next morning and wants to be sure it is in the best possible form.

To score a story for need for achievement, raters count the number of achievement-related themes in it. I count three: *working late; improved efficiency;*

best possible form. Questionnaires have also been devised to measure need for achievement. People taking this kind of test for need for achievement report whether they agree with a series of statements. Some sample statements are:

1. "I set difficult goals for myself which I attempt to achieve."
2. "I often do something just to prove to myself I can do it."
3. "I enjoy a race or a game better when I bet on it."
4. "Planning only makes a person unhappy because your plans hardly ever work out that way."

(The first two reflect a high need for achievement, the last two, reflect low need for achievement.)

Q3. Which of the following statements might you expect a person with a high need for achievement to agree with the most?

A. I want a job in which I work with people I like and enjoy being around

B. The best advice for career success I have heard is "It's not what you know, it's who you know that gets you ahead."

C. I often work on problems at work just for the satisfaction of getting a good solution

D. The most important feature of a job is the money I will earn

High scores for need for achievement correlate with several behavioral and social measures: better memory for unfinished tasks, more frequent volunteering for college and community activities, choosing experts over friends to work on tasks, more improvement with practice on complex tasks that the subject perceives success as reflecting his/her abilities.

People with a high need for achievement also adjust their targets based on past performance to be close to their maximum capabilities. For example, a task asks them to estimate how many "machines" they can build in 20 minutes. After each trial, they adjust their estimate based on how many they had succeeded in making. Money functions as a sign of accomplishment as much as a direct reward.

Outside the laboratory people with a high need for achievement look for occupations that let them solve problems and gain recognition quickly. They often become successful managers and entrepreneurs (a person who manages and assumes the risks of some enterprise, often in business). They are successful

managers in all kinds of enterprises (nonprofit, education, and government, as well as business) and in all kinds of economic systems (socialist and well as capitalist).

They seek out managerial and entrepreneurial jobs because achievements can be prompt and can be measured easily (costs reduced by 15%; productivity up 5%; defects down to 0.1%). Such jobs also provide recognition, usually promptly, for successful performance, which is also important to people with a high need for achievement.

To a person with a high need for achievement, the recognition that a good salary commands is as important to them as is the salary itself. They work hard at a task if they believe that success on the task will reflect their abilities, even if they get no monetary reward. Adding money as a reward for solving a task does not affect their performance.

For example, a manager of a mineral mining company in Utah realized that his workers were sleepy and tired all the time, inefficient, prone to make mistakes, and had generally low morale. The manager wondered whether the shift rotation they were on had anything to do with the problems he saw, so he started looking around for information. He finally found out about research on circadian rhythms (see asgn4j) and got a researcher working on the effects of

circadian rhythms in humans, who modified the shift schedule using principles of circadian rhythms. Production improved by more than 10%, accidents and absences were down, and morale was much better. This manager hunted for and found a solution for a serious problem. (Other managers with the same problem ignore it.) He may have had several reasons for doing so, but an important one was probably a high need for achievement.

Q4. Which of the following jobs might you expect a person with a high need for achievement to do especially well? All answers are counted as correct, but please give the question a bit of thought. I am curious what people will choose.

- | | |
|-------------------------|--|
| 1. professional gambler | 2. office manager for a nonprofit mental health clinic |
| 3. sales representative | 4. researcher studying information coding in the brain |
| 5. professional athlete | 6. commercial airline pilot |

Scientists probably have only average need for achievement. The respect and approval of colleagues are very important to scientists, but it doesn't have to come in six months. Scientists can work on research problems for years before success is apparent -- a delay that people with a high need for achievement would find difficult to take. Airline pilots need to be very skillful, but most of the time those skills are invisible to most people. My guess, therefore, is that pilots may not usually show a particularly a high need for achievement.

My guess is the office manager. A successful office manager needs a variety of skills. S/he needs to be able to organize office procedures, keep accurate records, and meet the needs of the staff, the insurance companies, government officials, as well as clients. The efficiency of the operation depends a lot on how well the office operates. Of the others, the sales representative is another choice. Sales representatives get prompt and regular feedback on their success, and success can be improved by a good knowledge of the products and careful research on the needs of the organizations to which s/he sells.

No one has only one social motive. What people do depends on several. A person with a high need for both achievement and power is likely to behave differently in many situations than does someone with a high need for both achievement and affiliation.

Performance on a task reflects the product (multiplying) of three things:

- **need** (the motivation to do the task)
- **skills** (the expectancies for success on the task)
- **value** (desirability of success)

This can be expressed as an equation: Performance = need x skills x value.

Because the three terms multiply, performance will be low if any of the three is low. People with a high need for achievement will not try particularly hard or do particularly well on a task.

5. if the task is so difficult that they will succeed only by chance (expectation of success is low)

if the task is so easy that anyone can succeed at it (desirability of success is low).

Task performance is the product of all three things, not just need for achievement. Therefore, people with a high need for achievement will prefer tasks that are moderately difficult: not so hard that they can't possibly expect to succeed, except by chance, and not so easy that most people can succeed.

The preference for tasks of moderate difficulty is illustrated in a study in which children chose the distance from which they would try to toss rings onto a peg. Children with low need for achievement often stood either very close or very far away from the peg. Anyone very close to the peg can drop the ring onto it. Anyone very far away from the peg will get the ring on it by chance. Children with high need for achievement preferred an intermediate distance. Here, they had a reasonable chance to get the ring onto the peg, but it required some skill and effort to do so.

Q5. Participants are told that the task they are about to do measures planning and estimating skills. The task asks them to estimate how many copies of a Tinkertoy "machine" they can build in 15 minutes. Then they build them. They repeated the task four times. Compared to people with low need for achievement, people with a high need for achievement do better because they

- A. have motivation for success on the task because of their high need for achievement
 - B. believe that the task reflects abilities that are important to them
 - C. have enough skills to do the task fairly successfully
 - D. A, B and C are all required for doing well
-

The origins of high need for achievement lies in parents' expectations for independence and self-reliance, but NOT neglect; caregivers must be available but not dominate. Parents expected boys

with a high need for achievement to know their way around town, try hard for things on their own, make their own friends, and do well in competition (*Winterbottom*, 1953).

Q6. Which of the following is most likely to develop high need for achievement in a child?

- A. Put minimum restrictions on his/her personal growth
 - B. Have the genes for high need for achievement
 - C. Expect him/her to do chores, homework, etc. without supervision
 - D. Show him/her how to do tasks correctly and monitor performance
 - E. Deprive him/her of independence well below operant level his/her operant level for independence
-

McClelland and his colleagues realized that need for achievement is a characteristic of cultures as well as individuals. They measured need for achievement in cultures by treating popular stories as if they were responses to TAT pictures. The themes in popular stories reflect what a culture thinks is important, just as the themes in stories people make up about TAT pictures appear to reflect what they think is important (McClelland, 1961).

ment expresses itself in the increased economic activity. For example, the United States had enormous economic expansion in the late 19th and early 20th centuries. The popular stories of that time frequently reflect success and mastery. We even have the expression "Horatio Alger story" based on the author of books about heroes successfully rising to the top.

McClelland measured need for achievement in stories from many cultures at many different times in history and found a substantial correlation between need for achievement in the stories and economic activity. They believe that a culture's high need for achieve-

Social motives, like the need for achievement, can be modified by environmental factors. They can be activated by environmental stimuli, and they can be increased by teaching. McClelland showed that a training program can increase managers' need for achievement, which gets expressed as more successful entrepreneurial activity.

Q7. Greek myths from the 5th and 4th centuries BCE often describe the skill and cunning of the characters in getting the goal they set out for. During that period, and shortly after that, Greece had its "golden age" of economic and political power. McClelland found the same sort of relation for many cultures at many different times. According to McClelland, this relation exists because

- A. popular stories can serve as a TAT test for a culture
 - B. these stories show a high level of need for achievement
 - C. a culture's need for achievement is related to its economic activity
 - D. A, B and C are all correct
-

For a summary of McClelland's theory of need for achievement, click [HERE](#)

There is no asgn4u

asgn4v --MOTIVATION: Addiction I

The use of "recreational" drugs has expanded dramatically since the mid-1960s. More people use them, and they start using them younger. These drugs produce several problems:

6. Almost all recreational drugs disturb users' awareness of the world around them and their ability to function in it. The disturbance can be quite subtle. One study tested effects of alcohol on experienced bus drivers with good safety records. A single drink made several of them seriously overestimate their ability to drive a bus between closely spaced poles. Some even tried to drive between posts separated by less than a bus width.
7. Most recreational drugs increase the risk of various kinds of disease, either directly or indirectly. The role of tobacco in cancer and cardiovascular disease has been the strongest reason for the dramatic restrictions in its use over the past decade.
8. Almost all of them are illegal, and penalties can be very severe and very costly to the person who receives the penalty and also to society, which must pay for enforcing the penalties.
9. Many of them are very addictive, which compounds the first three problems. Addictions are very powerful motivations, as chain smokers can testify. Many people say they want to quit smoking but find it too difficult. Even people who may need to have limbs amputated because of the effects of nicotine on blood flow continue smoking. The addiction can remain in the absence of smoking. People can relapse and start smoking again quite easily even years after having stopped. The same is true of all of the more addictive recreational drugs, which include cocaine, amphetamine, and heroin as well as nicotine.

The National Institute of Drug Abuse (NIDA), a part of [the National Institutes of Health](#), has prepared a [Drug Abuse and Addiction Media Guide](#). It provides reporters a reliable source of information about the process of addiction, the properties of most chemicals with the potential for abuse and abuse, and treatment

strategies for the addictions. It treats addiction as a brain disease with biological, psychological, and social causes and summarizes the biological, psychological, and social consequences of addiction

Political considerations, social pressures, and historical accidents usually drive public policy on recreational drugs more than does objective evidence on the psychological, behavioral, and physiological effects of the drugs. For example, many researchers believe that the psychological and physiological consequences of marijuana are not very different from those of tobacco and alcohol. (That doesn't make marijuana safe to use; using alcohol and tobacco carries substantial risk of physical and/or psychological harm.) Yet tobacco and alcohol are legally available, whereas marijuana is classified with heroin and cocaine as a very dangerous drug with no useful medical benefits.

The biggest difference between tobacco and alcohol on the one hand and marijuana on the other is that tobacco and alcohol have a long history of use in our society. So the social machinery has developed to deal with them, however inadequately. Marijuana is a rather recent addition to our culture, and society has yet to figure out how to deal with it.

Here are some useful links on recreational drug use [Link to a site that opposes all forms of recreational drug use](#). [Link to a site that claims the harsh penalties imposed on users make the drug problem much more severe.](#)

Below are links to a few of the many web sites about marijuana. They reflect the wide spectrum of opinion about this recreational drug. The first one seems to me to be the most reliable. The second and third are anti; the fourth is pro.

1. [New Scientist Marijuana Report](#)
2. [Marijuana Anonymous](#)
3. [Indiana Prevention Resource Center Factline on Marijuana](#)
4. [Institute of Medical Marijuana, Rotterdam, The Netherlands](#)

Q1. The biggest difference between alcohol, tobacco, and marijuana is probably that marijuana
A. is the most addictive **B.** causes the most health problems **C.** disturbs awareness of the world the most
D. is illegal **E.** all of the above are important differences

Opium and its relatives, cocaine, and other recreational drugs used to be easily available in the United States and in the rest of the world. Opium

(source of heroin and morphine) used to be easy to get in the US. Until the early 20th century, popular patent medicines included it, and physicians often

prescribed it. Habitual use was quite common and did not necessarily prevent successful professional life. In traditional China, a business executive might relax with a pipe of opium at the end of the day, the way an American business executive relaxes with a couple of martinis.

Most traditional recreational drugs pose little danger of abuse or addiction, if people take them in an unpurified form in ways that prevent rapid entry into the brain. The native people of the Andes Mountains in South America chew coca leaves, from which cocaine is extracted, as they work. It gives them stamina to work long and hard under difficult physical conditions. It appears not to produce ill

effects, probably because chewing a few leaves quite slowly extracts only a small amount of cocaine. The original formulation of Coca Cola contained a small amount of cocaine.

Purifying and concentrating the drug and speeding its entry into the brain greatly increase a drug's potential for producing abuse and addiction. Fairly simple chemistry concentrates cocaine, so users can now get it in much larger doses. Cocaine that is sniffed or smoked enters the brain in large amounts within a few seconds. The speed with which it acts seems especially important for increasing the chemical's euphoric (~feeling good) and addictive effects.

Q2. Many recreational drugs that are illegal in the U.S.

- A.** have never been considered safe for casual use in the U.S. **B.** have always been illegal in the U.S.
C. have never been considered safe for casual use anywhere in the world
D. were commonly and legally used in the U.S. before they were made illegal **E.** A, B, and C are all correct
-

The following summarizes some of the main toxic effects of the more common recreational drugs and their relative addictive risk.

! Caffeine (in coffee, tea, colas, chocolate) can produce restlessness, insomnia, and irregular heart rate, especially in people who are more sensitive to it. Chronic (long time) use can produce elevated blood pressure, anxiety, withdrawal headaches. It is weakly addictive. Most people can stop using it with only modestly annoying withdrawal effects, which fade in a few weeks.

! Nicotine (tobacco products) speeds up the heart rate, produces tremor, and can produce nausea. Chronic use increases the risk of ulcers, heart disease, and stroke because it constricts arteries and reduces blood flow. This effect can produce gangrene (~tissue death) in legs and arms, which must usually be amputated. It can affect fetal development during pregnancy. Other ingredients in tobacco increase risk of lung disease including cancer. It is very addictive.

! Alcohol probably has the highest social cost of any drug because it lowers inhibitions against risk taking. Compounding this problem, people who are especially inclined toward risk taking anyway often use too much of it. Therefore, it is an important contributing factor in many accidents, fights, and violent crimes. Alcohol decreases people's abilities to function well in many work and social situations. It is easy to get, and many groups consider it socially acceptable or even necessary to use. Some groups expect people to overindulge (= get drunk).

Alcohol impairs motor control, reaction time, thinking, and judgment. It increases impulsive actions that can be reckless or violent (most fights are alcohol related). Chronic use can lead to high blood pressure, liver and other digestive disease, and brain damage (including Korsakoff's amnesia, a form of severe anterograde amnesia). Withdrawal can lead to seizures and delirium tremens. Alcohol is moderately addictive.

! Cannabis (marijuana) impairs motor control, time sense, and perceptual judgment. Chronic use can lead to mental slowing, impaired memory and learning, and perhaps impaired immune response. Cannabis is moderately addictive. (Link to information on the [debate about medical uses of cannabis.](#))

! Opiates (opium, and its derivatives, heroin and morphine, and their artificial relatives [like Darvon®]) produce sedation, emotional blunting, shallow breathing, and slowed gut activity. They impair body temperature control and suppress sex hormones. They can be fatal if taken with alcohol, with sleeping or with anti-anxiety medications. Chronic use can produce severe constipation and disturbed hypothalamic and pituitary control of internal environment. Withdrawal produces cramps, diarrhea, vomiting. Opiates can be very addictive under some conditions. However, risk of addiction is quite low when opiates are used to treat chronic (~lasting) pain. Regrettably, the many members of the medical profession are reluctant to prescribe these medications in doses that are adequate to achieve good control of pain, even in terminally ill patients.

! Hallucinogens (LSD, mescaline) produce perceptual distortions and hallucinations, and "depersonalization" (boundary between self and world weakens). Chronic use can produce flashbacks (unexpected reappearance of drug effects), depression, and psychotic episodes. Hallucinogens are weakly addictive.

! Stimulants (cocaine and amphetamine) produce intense euphoria (feeling good) quickly if they are "snorted" or smoked. They increase blood pressure

and body temperature and make the heart beat irregularly. They can produce acute psychosis with hallucinations, delusions, paranoia, and violence. Chronic use can produce unpleasant skin sensations, stereotyped activity (e.g., men compulsively take apart mechanical devices; women repeatedly rearrange purses), seizures, psychosis, and, on withdrawal, depression. These drugs, in their most rapidly absorbed forms ("crack," "ice"), are the most addictive of all drugs.

Match the effects with the drug they fit the best.

1.nicotine 2.cocaine 3.heroin 4.alcohol 5.cannabis (marijuana)

Q3A. extremely addictive; makes the user feel wonderful very fast; increases blood pressure; can produce severe mental disturbance

Q3B. very addictive; quieting; depresses control of the inside of the body

Q3C. very addictive; calming; makes blood vessels small; increased risk of ulcers, heart disease, stroke

Q3D. moderately addictive; releases inhibitions; can damage brain with chronic (long term) use

Q3E. moderately addictive; calming; impairs time sense, motor skills; chronic use can impair memory

Why are many of these recreational drugs addictive? Why do many people continue to use them despite the harmful consequences the drugs can have? Explanations of addictions have emphasized three processes:

1. Addicts take more drugs to avoid aversive (unpleasant) withdrawal effects. This idea is associated with the drive model of motivation. For example, chain smokers report a very strong craving for a cigarette as soon as they finish one. Smoking relieves the unpleasant feeling chain that smokers report when they finish a cigarette.
2. Addicts take drugs, especially cocaine, amphetamine, and nicotine to get strong euphoric (intense good feeling) effects. This idea is based on the Incentive model of motivation. Many chronic users of heroin and cocaine say they use the drugs to feel good. Users describe an intense pleasure when they "snort" or smoke cocaine. In contrast, tobacco smokers report that smoking calms them. This is why so many psychiatric patients, who are usually under a lot of stress, smoke. The potency of these drugs has been demonstrated in rats pressing a lever to

self-inject one or more of them. They quickly learn a response that delivers a small dose of cocaine, heroin, or other drug through a permanently implanted cannula (tube). Cocaine is particularly potent. Under appropriate conditions rats will self-inject it to the exclusion of virtually any other activity, including eating, drinking, and grooming. This results in severe physiological deterioration within a short time.

3. Repeated drug use changes metabolic (chemical activity required for life) processes in the neurons they affect, changing users' sensitivity to them. Recent evidence suggests that some people have a genotype that makes individuals biochemically similar to people who are addicted. They are, in a sense, pre-addicted.

An additional factor complicates the process of addiction. Many addictive drugs produce tolerance with repeated use. Tolerance refers to the need for progressively larger doses of a drug to produce the same effect that small doses had at first. This means that users need more and more of a drug to maintain a drug "habit."

Match the following effects of heroin with the process that produces them.

1. Heroin makes people feel so euphoric (very good) that they keep wanting more
 2. Why heroin makes people feel euphoric
 3. People keep on taking heroin to avoid unpleasant withdrawal reaction
 4. People require increasing amounts of heroin to produce its euphoric effects (or block withdrawal)
- Q4A.** addicting effect of avoiding withdrawal
Q4B. addicting effect of strong positive incentive
Q4C. fast, strong activation of brain's reward system
Q4D. tolerance

Addiction as avoiding withdrawal. The idea that addictions are based on avoiding withdrawal is the oldest. It was developed in the middle of this century and reflected the influence of drive theories which dominated thinking then (J. Stewart et al., 1984). Drives are produced by disturbing homeostasis, the steady state, which the body tries to maintain against various challenges (see asgn4l). Drives are supposed to direct behavior to relieve or prevent disturbances of homeostasis. Withdrawal reactions can be viewed as disturbances of homeostasis. This means that they produce a drive that can be reduced by getting rid of the withdrawal reaction. Hence addicts are supposed to continue taking drugs to avoid withdrawal.

Development of tolerance is associated with increased withdrawal reactions, partly through Pavlovian (classical) conditioning. Learning is involved in tolerance to a drug because it is often situation-specific. Tolerance is much stronger when users take a drug like heroin where they usually take it. It is much less likely to occur when users take the

drug in a new situation (Siegel, 1983). This is why the expected epidemic of heroin addiction among soldiers returning from Viet Nam was milder than predicted.

Many stopped using heroin when back in the U. S., because their surroundings were completely different and so did not trigger conditioned responses associated with heroin use in Viet Nam.

Pavlovian conditioning participates in the development of tolerance. According to a conditioning interpretation, the unconditioned stimulus is the drug's stimulating effect on its targets in the body. The Unconditioned Response is the body's reaction to the drug. The Conditioned Stimulus is the environment associated with drug administration. The Conditioned Response is, in this case, a reaction that is *opposite* to the effects of the drug. Such a reaction fits the general principle that the body tries to counteract anything that disturbs homeostasis.

-
- Q5.** A heroin addict requires more heroin than does a first time user to produce its effects. According to Siegal's model, this happens because
- A.** the setting in which heroin is usually taken triggers a Pavlovian Conditioned Response that mimics (imitates) heroin's effects
 - B.** the setting in which heroin is usually taken triggers a Pavlovian Conditioned Response that opposes heroin's effects
 - C.** heroin is a very strong positive reinforcer, which makes it hard to extinguish responses that earn it
 - D.** A and C are both correct
-

Siegel (1978) has shown that environmental predictors of several different drugs, medications, and hormones trigger body reactions related to the chemical used as the US (Unconditioned Stimulus) in Pavlovian conditioning. For example, morphine is a strong opiate analgesic (pain reliever), chemically closely related to heroin. Rats receive a standard dose of morphine daily in one particular setting. Then they are placed on a plate hot enough to make normal rat pick up a paw in 2-3 seconds. About 30 minutes after the first dose of morphine, rats pick up a paw only after 8-10 seconds. The slowed reaction shows the analgesic effect of morphine.

The latency for lifting a paw decreases over the 10 training days, until it is back to the normal 2-3 seconds. (Chronic [long lasting] pain behaves quite differently: less tolerance develops, and it develops much more slowly. Therefore, morphine and newer derivatives are useful in the control of chronic pain. In fact, morphine is often used as the standard against which to measure effectiveness of other medications for chronic pain) The rat has become tolerant to the effects of the morphine.

If the rats are tested again after getting the morphine injection in a very different setting, the latency rises to 6-8 seconds, nearly as long as after the first dose. If the rats receive an injection of salt solution where they have been getting the morphine, they are hyper-reactive to the heat and pick up a paw in 1-2 seconds, faster than normal.

These and other data indicate that the setting where the rat gets the injection of morphine serves as the CS (Conditioned Stimulus). The drug stimulates specific receptors in the body. This stimulation serves as the US, which triggers an UR (Unconditioned Response), the body and mental reactions characteristic of morphine. The CS start or elicit a CR (Conditioned Response), which in this case is opposite to the UR.

The quicker than normal paw withdrawal after the saline injection is also the result of conditioning. The saline injection (CS) triggered the usual body reaction (CR). The CR counteracts the reaction to morphine (UR), but the morphine (US) did not follow, so no UR was triggered. Therefore the body reaction to the

saline injection (**CR**) had nothing to counter and made the rat hyperreactive to the heat on its paws. (**CRs** are often, but not always, like their **URs**. In this case they are not, but they follow the basic rule that the **CR**, like any reflex, counteracts the effects of the US-UR).

This process appears to operate in humans. A cancer sufferer had a major overdose reaction to his normal dose of morphine, when he got it in a different place than usual. Some heroin addicts report that stimuli associated with drug taking can trigger severe withdrawal reaction. However, other heroin addicts report that such stimuli trigger something like the positive reaction of the drug.

Q6. An ex-addict returns to the place where he used to "shoot up" heroin and had a strong withdrawal reaction. In this situation, the place served as the ____; the withdrawal reaction was the ____.

- A.** instrumental discriminative stimulus; negative reinforcer. **B.** drive stimulus; learned drive.
C. CS (conditioned stimulus); CR (conditioned response). **D.** reinforcer; punisher. **E.** A and D are both correct

An opponent process [see asgn4m] may also contribute to drug tolerance and withdrawal effects.

The Opponent Process model states that a motivating stimulus, like heroin, triggers a positive A process (the heroin "rush"), whereas removing heroin from the body triggers a negative B processes (withdrawal).

Repeated administration of a motivating stimulus makes the A process get weaker and the B process get stronger. If this is true, then repeated doses of heroin will produce weaker and weaker "rushes" and stronger and stronger withdrawal.

Q7. The opponent process approach to motivation states that drug addictions are based on trying to

- A.** get a stronger B process triggered by the drug
B. avoid the strong B process produced after repeated use when the drug leaves the body
C. get a stronger A process triggered by the drug
D. avoid the stronger A process produced after repeated use when the drug leaves the body

asgn4v -- MOTIVATION: Addiction I
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asgn4w -- MOTIVATION: ADDICTION II

Addiction II

The major theory of addiction states that addictions are based on the euphoria (intense positive feeling) that strongly addictive drugs can produce. The highly addictive drugs, like cocaine, amphetamine, heroin, and nicotine, have one feature in common: Directly or indirectly, they increase the effectiveness of brain systems that use dopamine as their neurotransmitter.

These systems play an essential role in arousal, attention, and reward. They run from the brain stem through the lateral hypothalamus to the basal ganglia and frontal cortex of the forebrain. (See asgn2c and e to review these brain structures.) Cocaine and amphetamine can give an intense "high" very quickly, because they can reach the brain in seconds

and affect these systems directly. This effect gives these drugs their high risk for addiction.

The addictive potency of cocaine was not recognized for a long time, though evidence of it appeared soon after it was purified more than 100 years ago. Sigmund Freud was among the first to use cocaine. He was very enthusiastic about its pleasant, energizing effects, recommending it to his mother and his fiancée. But he tried to use it to cure a patient of his opium addiction, only to discover that the patient had become addicted to the cocaine. Freud stopped recommending cocaine. The addiction can sneak up on casual or weekend users: Such users may drift into addiction as they become less and less able to stop using the drug, when they want or need to stop.

Q1. Haloperidol, which is used to treat symptoms of schizophrenia, blocks (D2) dopamine receptors, so they cannot respond to dopamine. If this medication is administered to someone "high" on amphetamine, you would expect that person to

- Hint
- A.** become still more "high" **B.** have a schizophrenic breakdown
C. be unaffected, because these drugs specifically treat schizophrenia **D.** come down from the "high"

Cocaine and amphetamine activate the dopaminergic attention-reward systems directly. Other addictive recreational drugs affect it less directly. For example, the opiates activate brain systems that use endorphins. Some of these systems have their own reinforcing effects, probably through their calming and pain inhibiting effects. Others activate the

dopamine reward system through synaptic connections to it. Recent research (Pich et al., 1997; Glassman & Koob, 1996) has shown that nicotine and dopamine both activate the same areas of the basal ganglia and frontal forebrain. Link to articles in Scientific American about addictions.

Q2. Nicotine in tobacco is very addictive; it activates a (certain kind of) receptor for acetylcholine. This means probably means that

- A. acetylcholine, not dopamine, is the main transmitter in the reward system
 - B. the neurons affected by nicotine influence the dopamine reward system or its connections
 - C. nicotine activates the dopamine receptors in the reward system
 - D. nicotine and dopamine are actually the same drug with different names
-

Some people are more likely to develop addictive behaviors than do others (Blum et al., 1996). Individual differences in susceptibility to alcoholism have been studied the most. Pedigree (family tree), twin, and adoption studies all show that some forms of alcoholism reflect a genetic predisposition. Children in families with a history of alcoholism become alcohol dependant much more often than are children from families without alcohol abuse. Identical twins are more likely to be concordant (match each other) for alcoholism than are fraternal twins. Finally, adopted children are more likely to resemble their biological parents in alcoholism than their adoptive

parents. The genetic effects are much stronger among males than females.

The increased tendency to develop alcoholism is often associated with an abnormal form of the gene that codes a particular version of the (D2) dopamine receptor. This defective dopamine receptor is associated with many other addictive behaviors, ranging drug addictions to pathological gambling to antisocial personality. Blum et al. propose that the psychological deficit associated with this abnormal dopamine receptor is a deficiency in the ability to experience reward.

Q3. The abnormal dopamine receptor associated with (some forms of) alcoholism

- A. is present in many other kinds of addictive behaviors and other behavioral abnormalities
 - B. is (part of) the basis of the genetic contribution to alcoholism
 - C. reflects expression of an abnormal gene
 - D. A, B, and C are all correct
-

Berridge and Robinson (1995) have divided the incentive properties of addictive substances into two parts: "wanting" and "liking." Wanting refers to the anticipation of positive incentives, like drugs that activate the dopamine reward system. Liking refers to the positive evaluation given to positive incentives once they have been received. The terms "wanting" and "liking" refer to preconscious or unconscious processes that contribute to conscious wanting and liking.

instrumental behavioral responding to obtain something, in this case the addictive drug. Liking is evaluated in humans by their verbal reports of subjective experience and in nonverbal animals by direct reactions to stimuli. For example, bitter- or sour-tasting stimuli trigger a rejection reaction that includes characteristic face and mouth movements: opening and twisting of the mouth and tongue that normally occur when spitting out something that tastes bad. Sweet-tasting stimuli trigger mouth actions that resemble those used in licking and eating: the tongue and the mouth make licking and swallowing movements.

Most research on reinforcement and motivation has failed to distinguish between these processes, but they can be separated. Wanting is evaluated by

Q4. Berridge and Robinson measured wanting something by _____, and liking it by _____.

- A. how hard a person works to get it; whether a person accepted or rejects it
 - B. how strongly the brain dopamine pathway reacts to it; how strongly the rest of the brain reacts to it
 - C. how hard a person works to get it; how hard a person works to get it
 - D. whether a person accepts or rejects it; whether a person accepts or rejects it
-

You would expect these two measures, direct reaction to a stimulus and responding to get it, to be very closely tied together, and usually they are. But

under some conditions, stimuli can be liked but not wanted. For example, a person who has just eaten may not particularly want to drink sweetened water.

Nevertheless, they report that it tastes just as sweet as it does when they are hungry (Canabac, 1971).

Conversely, *stimuli can be wanted but not liked*. One particularly dramatic example comes from a study on experienced heroin users, who were asked to self-inject morphine (closely related to heroin) or a saline (salt) placebo. The rate at which they self-injected was the measure of their wanting, and their rating of the "quality" of the drug was the measure of their liking. These heroin users reported that the saline was worthless as a drug and stopped self-injecting it. They reported that higher doses of morphine were high quality drugs and self-injected them.

In these two situations, the measures of liking and wanting agreed. However, when the heroin users got

a very low concentration of morphine to self-inject, they described it as worthless, like the saline. Nevertheless, 80% of them self-injected it as fast as they had self-injected the higher concentrations of morphine, which they reported "liking." They did not like the low concentration but they self-injected it anyway, showing that they still wanted it.

In another test, "recovered" addicts were given the antidepressant medication, desipramine, which decreases subjective craving for cocaine, as measured by disagreement with statements like "I want cocaine." Furthermore, cocaine and desipramine together induce unpleasant reactions of confusion and anger. But the addicts did not reduce self-injection, indicating they wanted the drug though they didn't like it.

Q5. In the experiments described above, the experienced drug users showed they wanted but didn't like the drug, because

- A. they self-injected drugs that they described as worthless or even unpleasant
 - B. they described the drugs as pleasant and good quality but refused to self-inject them
 - C. the drug activated their brain dopamine system from reward but not for pleasure
 - D. they went out and got more drugs after they finished the experiment
-

Berridge and Robinson propose that *addiction reflects sensitization of the wanting brain system*. This system is one of the dopaminergic (dopamine-using) pathways from the brain stem to the limbic system in the cerebral hemispheres. The sensitization depends on both the direct action of the drug and classical conditioning of stimuli associated with drug-taking.

The idea that "wanting" and "liking" are separable systems recently received strong independent confirmation. Garris et al (1999) found that *dopamine is necessary for maintained electrical self-stimulation of the brain reward system*. However, *dopamine release increased* not during the brain stimulation itself but rather *in anticipation of it*. This finding indicates that dopamine is released during "wanting," when a positive event is anticipated, but not during "liking," when the positive event is received.

Q6. According to Berridge and Robinson, addictions are based on

- A. voluntary self-injection as opposed to forced injection by someone else
 - B. liking sensitized by the direct action of the addicting drug and by environmental stimuli associated with it
 - C. wanting and liking sensitized together by simultaneous activation from the addicting drug
 - D. wanting sensitized by the direct action of the addicting drug and by environmental stimuli associated with it
-

Addictions seem abnormal and pathological. They often interfere with all other aspects of life. So you may wonder what "design failure" of the body lets addictions happen. *Addictions are actually based on normal body processes expressed in situations for which they are not adapted*. This idea explains why addictions seem to be largely associated with the influence of modern society. Addictions appear to be relatively rare in traditional societies, though they were usually the first users of the plants from which many addictive substances are obtained. (However, drunkenness is recorded in ancient civilizations and appears frequently in the Bible.)

attempt of people to deal with the abnormal stresses of Western society. But whether life in Western society is any more stressful than in traditional societies is questionable. Most traditional societies live under a lot of stress, but often rather different kinds of stress than occurs in Western society.

Another feature of modern society probably contributes much more to addiction: technology. *Technology permits concentrating the active substance in the natural product*, so that it is quite easy to get a large dose of the addictive chemical.

Some people propose that addictions reflect the

For example, alcoholic beverages made in traditional societies usually have a very low concentration of

alcohol and a lot of nutrients from the yeast that made the alcohol. You have to work at it to get drunk.

Alcoholic beverages in modern society are "purified" by removing the yeasts, etc., and have higher alcohol content. Many beverages are distilled to concentrate the alcohol further.

"Purifying" drugs can have another effect that increases their addictive potential. The modified drug is often in a form that gets into the brain faster. For example, the most addictive forms of cocaine are the ones they get into the brain in 15 seconds.

Q7. Cocaine is obtained from leaves of the coca plant. People native to the Andes mountains in South America, where the coca plant grows, chew the coca leaves to get extra energy and stamina. But they do not appear to get addicted because they

- A. break down the cocaine with their saliva
 - B. have become genetically tolerant to cocaine over centuries of use
 - C. live in the high mountains, where the air counteracts cocaine's effects
 - D. get only small, slowly absorbed doses of the cocaine from chewing a few leaves
 - E. all of the above contribute
-

There is also more direct evidence that addictions reflect normal body processes. Woods (1991) has proposed that the hunger and satiety (feeling full) are based on processes that are also essential to addictions. He claims that the regulation of eating depends on the same processes that produce drug tolerance.

When a meal is eaten, the blood gets a large dose of food. This can raise concentrations of body "fuels" (fatty acids, amino acids, and especially glucose [blood sugar]) in the blood to dangerously high levels. Long-lasting high levels of "fuels" (especially glucose) in the blood contribute to many different disorders, ranging from obesity to stress to complications of diabetes. The body prevents this from happening with anticipatory reflexes, both conditioned and unconditioned. These reflexes anticipate and prevent rising blood glucose levels by triggering the release of insulin. This hormone speeds removal of glucose from the blood into cells.

Insulin secretion is easily conditioned, just like the salivary reflex, which comes earlier in the digestive process. These conditioned responses have the same kind of effects as do the conditioned responses that produce tolerance to addictive drugs. Signals that indicate a meal is coming trigger increased insulin secretion. This produces a fall in blood sugar even before the meal starts. If the meal does not come, the blood sugar continues to fall and increases hunger. This may be one way in which people and other animals learn when and where to eat.

Thus, if Woods is correct, the same processes that produce tolerance in addictions also control eating. Just as tolerance to heroin is based on reflexes that oppose the action of heroin, eating is associated with reflexes that prevent too much "fuel" from accumulating in the blood (Woods, 1991). Eating differs from addictions because it has a process that stops eating. Addictive substances do not have such a process, so consumption of addictive substances can continue indefinitely.

Q8. Which of the following is a way that eating resembles addictions?

- A. They both help the body keep in homeostatic balance.
 - B. They both depend only on unlearned reactions to themselves as chemicals.
 - C. They both trigger body reactions that oppose their direct effects.
 - D. They both depend on the secretion of insulin to produce their effects.
 - E. A and D are both correct.
-

Link to an article about addictive processes in obesity.

Link an article showing that cocaine activates the same brain areas that normal pleasure does.

asgn4x -- MOTIVATION: Aggression

Here is some basic information for you to know about aggression:

- ! Aggression can be defined as attack by one individual on another.
- ! Aggression is not a single process.
- ! Aggression can help animals survive and reproduce, but only under some conditions.
- ! Threat and appeasement gestures regulate relations between individuals without actual fighting, which would be costly to both individuals.
- ! Genetic factors, hormonal factors, social factors, imitation, and aversive (very unpleasant) events like pain and frustration affect aggression.

Match the following with the idea they illustrate best.

1. definition of aggression 2. the reproductive advantage that aggression can give
3. two different kinds of aggression 4. social ranking maintained without costly fight

Q1A. Johnny hits his little brother over the head.

Q1B. Different brain systems produce a mother's aggression to protect her baby and a fight triggered by frustration.

Q1C. A dominant (~top) monkey gets more chances to mate.

Q1D. A subordinate wolf exposes its neck to a growling dominant wolf to prevent a fight.

Match the following examples with the factor in aggression they illustrate

1. social factor: imitation 2. genetic factor 3. hormonal factor 4. something unpleasant or annoying

Q2A. Injecting testosterone into an animal increases its chances of being aggressive.

Q2B. Seeing aggression increases chances of acting aggressively.

Q2C. Some strains (~breeds) of mice are much more likely to fight than are other strains.

Q2D. Patrick kicks the pop machine when it doesn't deliver the can of pop.

Aggression refers to attacks an individual makes on another individual. There are many different kinds of aggression, which appear under very different conditions and are organized differently in the brain.

For example, a feral (~semi-wild) male cat shows aggressing when it attacks and kills a mouse for food. It also shows aggression when it kills the kittens sired by other tomcats. These two forms of aggression are very different. The first example is directed at getting food. The second is directed at increasing his reproductive success, by getting rid of kittens he did

not father to make the females ready to mate again sooner. These behaviors are only superficially similar, and they appear to depend on different brain circuits.

Other forms of aggression include:

- ! aggression elicited (triggered) by frustration or other aversive (unpleasant) events.
- ! maternal aggression toward anything that appears to threaten her young.
- ! aggression used to establish and maintain a social hierarchy within a group.

Q3. Attacks can be triggered by *many different things*, ranging from attempts to maximize reproductive success to frustration to fear. This fact indicates that

A. Darwin's idea of the survival of the fittest is correct.

B. Aggression is not a single process.

C. Aggression is necessary for reproductive success.

D. Aggression is immoral.

E. Aggression is instinctive and its form is species-typical.

F. All of the above are correct.

Adaptation and Aggression

According to one version of evolutionary theory, aggression in all its different forms must have some adaptive advantage. However, aggression has its costs as well. For example, fights for dominance can injure or kill one or both. Furthermore, a nondominant animal can mate while the dominant (~top) animal fights a challenger.

Although the highest individuals in a dominance hierarchy have the best choices and opportunities to mate, this does not guarantee increased reproductive success. Packer et al. (1995) report that the pregnancies of dominant female baboons are more likely to end in spontaneous abortions than are those of some lower status animals. Packer et al. hypothesize that the stress of maintaining dominance interferes with reproductive functions.

Q4. Aggression can injure the aggressor, distract him/her from mating or other essential functions, etc. The result is fewer successful matings. These facts indicate that aggression

- A.** is always harmful. **B.** must be suppressed for reproduction to be successful.
C. does not necessarily lead to greater reproductive success and evolutionary fitness.
D. is really basically the same despite variation in conditions when it occurs.
-

Figure 1-4x. Monty Sloan/Wolf Park. Used by permission.



To prevent the costs of continuous aggression, **threat gestures** from the dominant (top) animal toward subordinates maintain social hierarchies in many species. The subordinate animal responds with an **appeasement gesture**, which usually stops the dominant animal's aggression short of actual attack. In dogs and wolves that gesture is rolling on the side or back and exposing the neck. Also, threat gestures are often enough to protect territory from others. The use of gestures to maintain social stability eliminates the severe costs of actual fights.

Figures 1 and 2 show two examples of dominance and submission between wolves. The dominant animal is at the left. Photos are of animals in the pack maintained at Wolf Park, near Battle Ground IN 47920, (765) 567-2265. Link [HERE](#) to [Wolf Park's home page](#).

[Link to an article about the way two younger female wolves deposed the dominant female in a pack.](#)

Probably all species have threat and appeasement gestures. Specific facial expressions and postures, serve as clear threat and appeasement gestures. The threat gesture in humans is a frown or an angry facial expression, with shoulders lifted and head thrust forward. The appeasement gesture in humans is a wide smile, often with hands partly lifted with palms out, and body shrinking and turning a bit away from the aggressor.

Figure 2-4x. Monty Sloan/Wolf Park. Used by permission.



Q5. Sam is in a sports bar. He bad-mouths a hockey player who happens to be the favorite of the 6'4" muscular man next to him. This man turns to Sam, raises his body, and pushes his shoulder and head forward. His chin juts forward at Sam, his mouth turns down, and his nostrils flare. Sam leans his head back, smiles and puts up his hand palm out. The big guy is making a (an) ___ gesture. Sam is making a (an) ___ gesture.

- A.** angry; calm **B.** dominant; submissive **C.** threat; appeasement **D.** fighting; chicken
-

Variables that affect Aggression

Reports of genetic factors in human aggression and violence have caused considerable controversy. The data supporting a genetic factor seem reasonably convincing. (Indeed, it would be very surprising if there weren't a genetic factor.) One study described a family in the Netherlands, in which aggressive

behavior appeared unusually often (Brunner et al., 1993). The members of this family who exhibited excessive aggressive behavior had a defective allele for a specific gene. This gene regulates an enzyme that breaks down the neurotransmitters, serotonin, and dopamine, and norepinephrine (see asgn2g). How this allele is expressed depends on the environment in which the individual grows up. Abused

children are much more likely to abuse as adults if they have this defective allele than if they have the normal one (Stokard, 2002, Caspari, 2002). *This is a good example of the interaction between genetics and environment.*

It is very important to recognize that *genetic factors are only a part of the story on aggression.* The variation in the amount of aggression over time in the

same population shows this clearly. Consider the amount of aggression in American society at different times. Aggression was high in the 20's and is high though declining now; it was quite low in the 40's and 50's. Clearly a genetic factor in aggression must have an environment that permits (or encourages) its expression. So despite the contribution of a genetic factor, the only practical routes for decreasing aggression and violence are social and environmental.

Q6. Genetic factors in aggression

- A. show up as higher correlations within identical twin pairs than within fraternal twin pairs
 - B. mean that social factors and environment have little effects on violence
 - C. depend on factors in the environment in which they are expressed
 - D. A and C are both correct
 - E. A, B, and C are all correct
-

Hormonal Effects on Aggression

Genetic factors probably contribute to aggression through several processes. One may be through regulation of levels of testosterone (the main androgen or male hormone) and other **anabolic** (body building) **steroid hormones**. These hormones play an important role in aggressive behavior. Male domestic animals not intended for reproduction are often castrated to make them easier to handle as well as to produce more tender meat.

Case studies in humans suggest that *anabolic steroids used for body building increase levels of aggression.* Sometimes users become unpredictably and uncontrollably violent. *Correlational studies show that more violent men and dominant men have higher levels of testosterone* in the blood than do less violent and subordinate men. Recent studies show that *just having watched an important athletic contest increases the testosterone* of male supporters of the winning team. Male supporters of the losing team

have a decreased level of testosterone. Other studies show that volunteers show more irritability and aggressiveness while receiving injections of high doses of steroids than while receiving placebo injections. Link to a *summary of this research.*

As in sexual behavior, testosterone has an organizing and an activating function (asgn4s) in aggression. Prenatal and postnatal (before and after birth) exposure to testosterone organizes the brain to be sensitive to the activating effects of testosterone on aggressive behavior especially after puberty. For example, castrating (removing male sex glands) male mice at birth limits the organizing effects. Therefore, testosterone injections in these animals as adults do not increase their aggressive behavior much. Testosterone injections can replace the natural source from the testes (~male sex gland). Mice castrated (~testes removed) at birth that receive replacement injections of testosterone show normal aggression as adults, if they receive activating testosterone injections as adults.

Q7. An adult bull can be very aggressive. It becomes easier to handle after it has been castrated because

- A. the organizing effects of testosterone are absent
 - B. the activating effects of testosterone are absent
 - C. the organizing and activating effects of testosterone are both absent
 - D. it is cut out not to be a father
 - E. it is no longer interested in sex and won't fight for it any more
 - F. D and E are both correct
-

Social Processes Affecting Aggression

In social animals, humans especially, social and other environmental factors also affect aggression. Experimental studies show that children easily learn to imitate adults behavior. In one study, boys watched a video showing people beating an inflatable clown dummy. These boys later hit the dummy more than did boys who watched a nonviolent video. Even exposure to objects like guns and knives, which are associated with violence, may lead to increased aggression in a laboratory setting (Berkowitz & LePage, 1967).

Although this kind of laboratory experiment seems artificial, similar results have been reported from laboratory studies and from other kinds of non-experimental studies on viewing violence (Anderson & Bushman, 1997).

Television violence has been blamed for behavioral violence, and *correlational studies have found a relation between the amount of TV violence viewed and level of violence.* One study showed an effect that appeared only after several years. The amount of violence that boys watched on TV while in sixth grade

did not predict how aggressive they were then, but it did predict measures of violent behavior as adolescents (Lefkowitz et al., 1977).

Aversive Events and Aggression

Exposure to aversive stimulation can also trigger aggression. Animals ranging from spiders to monkeys will attack another animal when they receive unpredictable electric shocks. Humans show this reaction to aversive stimulation. For example, after holding their arms in ice water, subjects punished a (fake) subject in another room more than did controls (Berkowitz & Embree, 1987; Berkowitz & Thome, 1987).

Physical pain is not the only aversive event that triggers aggression. Frustration, defined as failure to get an expected reward, also triggers aggression. If you put 75 cents into the pop machine and nothing comes out, you get quite annoyed. You may even give the machine a kick. I once put \$3 into a postage dispenser and got nothing out. Although I knew better, I gave the machine a whack and hurt my hand in the process. (Unexpected things really can get to me.)

Laboratory tests demonstrate the aversive motivating effects of frustration from extinction. Extinction temporarily makes responding (e.g., lever-pressing for rats; key-pecking for pigeons; panel-pushing in humans (remember the pop machine?) stronger and faster, which indicates motivation has increased. Also, animals behave as if they are upset (pigeons flap

wings, rats bite the lever). If another animal is present, the test animal being extinguished may attack it. This kind of attack resembles the attack on an innocent bystander that uncontrollable electric shock can elicit. These attacks that extinction can trigger reflect the aversiveness of the extinction.

Other data also indicate that extinction is aversive, because it can motivate escape or avoidance. Hungry rats learned to run down a long alley to get food at two places: halfway down and all the way at the end. On trials when the food halfway down the alley was absent, the rats ran the remaining length faster than when they found the expected food. The increased running speed when the rats did not get the expected food indicates an increase in level of motivation.

Freud and others claimed that anger once aroused must be expressed either directly or in some symbolic way to achieve catharsis (relief of the pressure of the bottled-up anger). However, research seems to show the opposite effect. Giving the opportunity to act on anger increases later aggression (Geen et al., 1975, Bushman et al., 1999). This finding fits the idea that expression of aggression can be reinforcing, which will increase the strength of aggression in the future. The reinforcement may be negative reinforcement, because expressing aggression appears to moderate the effects of stress. For example, giving rats under stress the opportunity to bite reduces stress-related effects on the body (Tanaka et al. 1998; Vincent et al. 1984).

Mark the following with a 1 if they are likely to increase level of aggression or with a 2 if it is likely to decrease level of aggression

1. increase aggression 2. decrease aggression

Q8A. watching a Rambo type movie

Q8B. castrating a male animal before puberty

Q8C. headache

Q8D. playing in a brawling intramural football game

Q8E. getting a C+ instead of expected B (didn't prepare for final)
