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Jeffrey Fagan

Intoxication and Aggression

ABSTRACT

Evidence of an association between use of illicit substances and aggressive behavior is pervasive. But the precise causal mechanisms by which aggression is influenced by intoxicants are still not well understood. Research on intoxication and aggression often has overlooked the nonviolent behavior of most substance users, controlled use of substances, and the evidence from other cultures of a weak or nonexistent relation between substance use and aggression. There is only limited evidence that ingestion of substances is a direct, pharmacological cause of aggression. The temporal order of substance use and aggression does not indicate a causal role for intoxicants. Research on the nexus between substance use and aggression consistently has found a complex relation, mediated by the type of substance and its psychoactive effects, personality factors and the expected effects of substances, situational factors in the immediate settings where substances are used, and sociocultural factors that channel the arousal effects of substances into behaviors that may include aggression. Contemporary explanations of the intoxication-aggression relation offer only limited explanatory power in view of the occurrence of controlled use of substances, the mutability of cultural norms, and cross-cultural differences.

Among contemporary explanations of violence and aggression, few have been more enduring than the presumed effects of intoxication from drugs or alcohol. There is pervasive evidence of an association between substance use and aggressive behavior. For example, drug abuse has been found to be a critical factor in homicide (Wolfgang and Strohm 1956; McBride 1981; Goldstein 1989), robbery and other “predatory” crime (Petersilia 1980; Chaiken and Chaiken 1982, in this

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volume; Johnson et al. 1985), school violence (Gold and Moles 1978), and violence among adolescents (Tinklenberg et al. 1981; Hartstone and Hansen 1984; Elliott, Huizinga, and Ageton 1985; Fagan, Piper, and Moore 1986; Johnson et al. 1986*a*; White, Pandina, and LaGrange 1987; Fagan 1989). Goldstein (1985) found that drug use and drug trafficking were etiological factors in violence, while McBride (1981) and Goldstein et al. (1989) found that systemic factors in drug dealing were causal factors in homicides.

Adolescent drug abuse has been cited as a predictor of violent adult crime and criminal careers (Monahan 1981; Greenwood 1982; Wish and Johnson 1986). Among both the general youth population (Elliott, Huizinga, and Ageton 1985; Johnson et al. 1986*a*) and adult criminal groups (Gandossy et al. 1980; Chaiken 1986; Wish and Johnson 1986; Wish 1987), both official and self-reported crime rates are highest for heroin or cocaine users. There is a general and long-standing consensus that criminality among heroin addicts is quite high (McGlothlin, Anglin, and Wilson 1978; Nurco et al. 1984; Johnson et al. 1985; Anglin and Speckart 1988), particularly during periods of addiction (Ball et al. 1982). There also is evidence that rates of violence are associated with more frequent and abusive drug use; as drug and alcohol use becomes more frequent and abusive, the strength of the association increases. For example, Johnson et al. (1986*b*) found that adolescent violence may be a consequence of drug use—more frequent and intensive highs are associated with serious and frequent delinquency.

Alcohol intoxication also is often cited as contributing to violence and aggression. Alcohol use has been associated with assaultive and sex-related crimes (Rada 1975; Ladouceur and Temple 1985; Prentky, Knight, and Rosenberg 1988), serious youth crime (Akers et al. 1979; Elliott, Huizinga, and Ageton 1985; White, Pandina, and LaBouvie 1985; Fagan, Weis, and Cheng 1990), family violence toward both spouses (Coleman and Straus 1983; Hotaling and Sugarman 1986) and children (McGaghy 1968; Mayer and Black 1981), being both a homicide victim (Wolfgang 1958; Haberman and Baden 1974) and perpetrator (Wolfgang 1958; Tanay 1969), and persistent aggression as an adult (Collins 1981, 1989; McCord 1983). Alcohol “problems” occur disproportionately among both juveniles (White, Pandina, and LaBouvie 1985) and adults (Collins 1986) who report violent behaviors.

Accordingly, drugs, alcohol, and aggression have become major public health problems as well as a focal point in crime control policies

(Epstein 1977; Inciardi 1981; Musto 1981).¹ The World Health Organization (1979) concluded that alcohol was implicated worldwide in 13–50 percent of rapes, 24–72 percent of assaults, and 28–86 percent of homicides. In a sample of 1,000 consecutive decedents in New York City over eighteen years of age, Haberman and Baden (1974) found blood or brain alcohol concentrations in excess of 10 percent in 30 percent of accident victims, 26 percent of suicide victims, and 43 percent of homicide victims. Similarly, Goldstein et al. (1989) found that drugs were involved in 54 percent of New York City homicides. Studies with prison populations cite the predictive efficacy of juvenile drug use (especially opiates) in combination with early onset of delinquency and drug dealing, to explain chronic adult predatory crime (Greenwood 1982). Petersilia (1980) found that among prison inmates, the most serious offenders were involved with *both* alcohol and drug abuse, although those who used only alcohol committed fewer and less serious crimes.

Yet the link between intoxication and aggression is less certain than is implied by the scientific literature and popular opinion. Despite overwhelming evidence that drug and alcohol use and aggression are related, this essay shows that intoxication does not consistently lead to aggressive behavior. How aggressive behavior is influenced by the ingestion of various substances is not well understood. There are fundamental differences between substances in their association with aggression; various intoxicants affect both mind and body differently. Research on the nexus of aggression and substance use has consistently found a complex relation, mediated by personality and expectancy factors, situational factors, and sociocultural factors that channel the arousal effects of substances into behavior types which may or may not involve interpersonal aggression. The effects of intoxicants also differ according to the amounts consumed per unit of body weight, tolerances, and genetic or biological predispositions.

Accordingly, there is only limited evidence that consumption of alcohol, cocaine, heroin, or other substances is a direct, pharmacologically based cause of crime. Although intoxication is widely found to be

¹ It is not surprising that this concern has translated into policy. New calls have gone out for stiffer sentences for dealers, increased testing for arrestees in detention and during pretrial periods (irrespective of offense or prior record), and greater emphasis on drug-use patterns in detention and sentencing decisions (e.g., selective incapacitation, preventive detention of arrestees who test positive).

associated with aggressive conduct, the association is far from consistent and the reasons are diverse and poorly understood. Research has not identified specific drug-produced motivations for violence by adolescents that did not exist prior to using drugs (Akers 1984), and there have been few studies that found that aggression did not precede substance use.

The research traditions that have guided inquiries into the relation between substance use and aggression reflect the competing explanations that today characterize empirical knowledge on how substance use modifies behavior. Despite the partition of research among the natural, social, and medical sciences, the relative contributions of the separate disciplines offer an impressive array of information about the relation between aggression, alcohol, and drug use. For example, Boyatzis (1983, p. 314) concludes that we know "who should drink what, when, and where if we are looking for a fight."

Yet the specialization of research within disciplines also hinders the accumulation of knowledge and the development of theory. The dominant research models do not lend themselves easily to synthesis or integration. For example, the results of controlled experiments in the "competitive reaction" paradigm, in which subjects can set the shock level an opponent receives in a reaction time test (e.g., Taylor, Gammon, and Capasso 1976), are not generalized easily to knowledge from cross-cultural studies. While ethnographic studies attend to the roles of setting and expectations, they cannot achieve the controlled conditions of experimental psychologists who can vary the intensity of intoxication and degree of provocation of stimuli of aggression. Each discipline also reflects separate traditions of empirical research by type of substance, in part reflecting separate problem definitions by substance and the attendant separation of research support and policy in governmental agencies.

Scientific advances within disciplines are also hindered by their own methodological concerns and procedures. Despite advances in cross-disciplinary integration of theory and methods in the study of addictions, researchers in each discipline have difficulty reaching consensus on definitions and measurement issues concerning aggression, intoxication, and addiction. Ethical and human subject issues are a further source of complexity and limitation.² Accordingly, the current knowl-

² One should think twice before administering alcohol or drugs to addicted subjects, crossing threshold levels of aversive stimuli, or allowing unlimited severity of aggression in either experimental or natural designs.

edge base is extremely complex, reflecting not just different assumptions across disciplines about the linkages between aggression and intoxication but also important epistemological differences that separate the disciplines.

The diversity of research traditions naturally leads to controversy in defining aggression and intoxication. An example illustrates the complexity in defining aggression. Predatory behavior, learned aggression, and fear-induced aggression are included in broad, encompassing definitions of aggression, yet the biological, psychological, and social influences that determine them seem to differ. Also, corporal discipline or punishment rarely is included in definitions of aggression, nor is it defined as a crime in most states. Apparently, the social and legal meanings of aggression and violence differ, depending on the victim-offender relationship and the presence or absence of physical injury (Fagan and Wexler 1985).

Research paradigms also influence definitions. Aggression may be operationally defined and measured by (1) the intensity and duration of shocks administered in experimental studies; (2) bites, noises, and postures in ethological studies; (3) physical assaults or other antisocial behaviors in sociological research; and (4) a variety of culture-specific behaviors in comparative studies. Pihl (1983) suggests that aggression is a multidimensional concept where the intent of the aggressor and the legitimation of the aggressive act must be part of the definition. This suggests that aggression can be defined as any behavior whose intent is to deliver harmful stimulation; research on aggression, in turn, requires quantifiable dimensions of the behavior that vary in intensity.

A brief review of the definitions in contemporary studies offers common ground for reconciling the diverse research traditions. Bandura (1973) defined aggression as behavior that results in personal injury or property destruction. We cannot exclude property destruction, however, since it may also include the intention to harm the owner of the property. Bandura's definition is consistent with the definition of violence offered by Gelles and Straus (1979) as "an act carried out with the intention of, or perceived intention of, physically hurting another person." Gelles and Straus (1988) distinguish violence from aggression, which includes *any* malevolent act, regardless of whether physical harm is involved.

If we define aggression to include the important dimension of *intent* to harm, then symbolic and verbal aggression, as well as nonverbal aggression (e.g., bodily gestures or postures), also are types of aggres-

sion (Boyatzis 1975). Vogel (1983, p. 245) adds the element of *unjust* harm to his definition of aggression but does not include what he defines as normative assertiveness which is "absolutely necessary for men and women to live and survive, find their places in society, and advance to the fullest extent of their potentials." Moyer (1968) found different neural and hormonal determinants for each of the following types of aggression: predatory aggression, intermale aggression, fear-induced aggression, irritable aggression, maternal aggression, sex-related aggression, and instrumental aggression. Miczek and Thompson (1983) further distinguish between offensive and defensive aggression.

Obviously, aggression is not a unitary phenomenon, and the number of different kinds of aggressive behavior suggests that they cannot be reconciled within a single theoretical model. In this essay, aggression is defined as behaviors that reflect either the intent to harm, by inflicting physical pain or noxious emotional or psychic conditions, or the intent to create a noxious condition for the target. Collins (1983, 1988), focusing exclusively on violent behaviors defined as an actual or attempted physical attack, terms this "expressive interpersonal violence." Research on aggression within families, gangs, or other social settings shares these definitional components with research on aggression among animals, and also in experimental studies with human subjects and animals, that measured threats, postures, and declarations of hostility or rage. Such a broad *conceptual* definition requires careful attention to the *operational* definitions and attendant measures in the studies reviewed.

Similar problems arise in the definitions of substance use and intoxication. The interactions of physical tolerance or habituation, physiological predispositions such as metabolic rates, and the effects of substances also should be considered in definitions of intoxication. For example, blood-alcohol counts produce varying states of intoxication for individuals with different tolerances, metabolic rates, and body weights. Although most studies strive to generalize from alcohol or drug use to the effects of intoxication, few operationalize and measure intoxication or addiction or the factors that mediate them with enough care to distinguish between these states. These problems confound the distinctions between alcoholism and alcohol use, or drug addiction and drug use. For example, Gottheil et al. (1983) question whether it is practical or theoretically significant to label alcoholics on the basis of their genetic predisposition or their behavior, especially if such predispositions exist among individuals who do not drink.

Attention to these definitional and measurement distinctions will permit estimates of the extent to which empirical research on the intoxication-aggression relation reflects measurement and design artifacts or "true" effects.

This essay addresses the fundamental question of how aggressive behavior, given any particular model and research paradigm, is influenced by the ingestion of various substances. There are also additional questions of central importance, such as whether aggressive individuals differ from others in their patterns of substance use and also whether substance use has differential effects in instigating aggressive behavior among different individuals and in different settings. When the interactions of substance, individual factors, setting, and culture are considered, to what extent is there a pharmacological and biological basis for the assumption of an aggression-intoxication linkage? How much of the explained variance in the intoxication-aggression relation is attributable to biological, psychological, social, or cultural sources of influence? Does the ingestion of substances "cause" specific individuals to become violent or aggressive, while for others intoxication becomes a suppressor of violence? In the end, the essay asks whether the linkage between intoxication and aggression is evident independent of socially learned cues and the determining influences of culture and expectancy.

There has been an abundance of research to contribute empirical and theoretical knowledge to answer these questions. The studies range in discipline and method from controlled experiments on psychological disinhibition to cross-cultural research to biochemical and neurological examinations of both humans and other mammals. Within each of these paradigms, the effects of alcohol, tetrahydrocannabinol (cannabis, or, more commonly, marijuana), amphetamines, phencyclidine (PCP, or "angel dust"), cocaine, and opiates have been examined. Until recently, these inquiries have proceeded in parallel paths, with few efforts to synthesize knowledge across either substances or disciplines. Current research has recognized the importance of interactions between the disciplines.

In Section I, the essay reviews the empirical knowledge within each discipline, contrasting findings for different substances. Research within psychological, biological, pharmacological, and sociocultural disciplines is discussed. The strategy is to report critical findings from specific studies, chosen from the hundreds of citations that make up that empirical literature, that are representative of the dominant views in that discipline for that substance. Section II critically examines the dominant explanations and theories of the relations between substances

and aggression. Section III analyzes promising areas for theoretical integration and model development and concludes with a research agenda and recommendations for integrative research.

I. Theory and Research on the Relations between Substance Use and Aggression

The robust association between substance use and aggression has been observed in a wide variety of sampling and measurement conditions. Although the frequency and intensity of aggression that follows intoxication varies extensively, there can be little doubt that, for many people in diverse settings and cultures, substance use may be causally related to aggression. However, the relation between substance use and aggression also may be accidental or facilitative. These relations leave unanswered the precise mechanisms by which these two factors are related.

Efforts to explain the relation generally fall into one of four disciplines. Biology and physiology seek to identify unique physiological, endocrinological, or neural factors that are activated by substances to induce aggressive responses. Psychopharmacological research focuses on the psychoactive properties of specific substances that are likely to cause aggression. Psychological and psychiatric study relies on personality theory and dynamics to identify the behavioral manifestations of intoxication. More important, these disciplines view intoxication as simply a sideshow in the service of a more significant dynamic of internal conflict or emotional pathology (Jessor and Jessor 1977; Mayfield 1983). Sociological and cultural research is concerned with setting, expectancy, social interactions, cultural norms and sanctions, and other processes that differentiate the aggregate behaviors of individuals following intoxication.

A. Biological and Physiological Perspectives

Contributions from the medical and biological sciences to explanations of the intoxication-aggression relation encompass several specific subdisciplines, including neural mechanisms, endocrine and other glandular responses to substances, and comparative ethological processes. Accordingly, mediators such as brain response (electroencephalogram), testosterone levels (glandular responses), and catecholamine measures such as norepinephrine levels have been examined. However, Mayfield (1983) doubts whether these theories can be tested or advanced within the controlled laboratory setting for two reasons. First,

there is little understanding of how alcohol intoxication causes drunkenness, despite the significant advances in explaining the actions of opiates, anticonvulsants, and neuroleptic drugs. There is little knowledge of what specific brain regions are affected by high blood-alcohol levels. Second, most research with human subjects in this paradigm has been done at the "minimum end of the spectrum where normal subjects are drawn primarily from university populations and studied under conditions of mild intoxication and simulated stress" (Mayfield 1983, p. 146). Despite the experimental rigor that characterizes these studies, they often produce small changes in behavior.

Accordingly, theoretical interpretations are likely to be constrained by the restricted range of behavioral responses (Taylor and Gammon 1976). It is uncertain whether the dynamics produced under subtle laboratory conditions would be valid under extreme conditions of intoxication or aggressive behavior. Nevertheless, there is sufficient empirical evidence to evaluate the contention that basic brain and glandular functions are altered following the ingestion of a wide range of substances.

1. *Psychophysiological Effects.* Research on the psychophysiological bases for aggression typically examines the effects of electrical and chemical stimulation of brain pathways, as well as lesion studies, in the production of aggressive behaviors. Research in this area has sought to identify specific pathways and stimulus thresholds that provoke aggression (Moyer 1976). Moyer states that the basic premise of this model is "that there are in the brains of animals and humans neural systems that when fired in the presence of a relevant target result in aggressive or destructive behavior towards that target. In the case of humans, the actual aggressive behavior may be controlled, but the individual will have the appropriate feelings of hostility. There is now abundant evidence to support that premise" (1983, p. 191).

The "abundant evidence" includes studies of brain stimulation in humans, brain tumors and aggression, aggression during epileptic seizures, weakened suppressor systems and hereditary influences, and blood chemistry changes in aggressive subjects. For example, Robinson, Alexander, and Bowne (1969) illustrated innate aggression in monkeys based on electrical stimulation of the anterior hypothalamus. However, though Moyer (1983) cautions against broad generalizations from one species to another, he reports similar behavioral changes following brain stimulation of human subjects with low base rates of aggression.

Sano (1962) reported on 1,800 cases of tumors in regions of the brain that produce irritability and aggression: the septal region, temporal lobe, and the frontal lobe. Similar findings have been reported for epilepsy; the probability of aggression increases with the occurrence of temporal-lobe epilepsy. For example, Schwab et al. (1965) reported destructive behavior and bursts of anger among about half the psychomotor epileptic patients. Studies of blood chemistry influences on aggression range from analysis of testosterone levels in sex offenders (Bradford 1988) and animals (Beeman 1947) to violence that occurs during the premenstrual week. Hypoglycemia, a condition marked by a sudden drop in blood sugar levels, also has been associated with aggression (Bolton 1973, cited by Moyer 1983).

Though this literature pinpoints specific neural systems where aggression results from stimuli of neurotransmitter, endocrine, and pharmacological manipulations, there has been little experimental evidence that employs alcohol or psychoactive drugs as stimuli. Accordingly, there is little evidence that intoxicants either decrease or increase aggression by their actions as stimuli of the different neural systems and brain pathways of aggressive behavior. Moreover, how intoxicants actually stimulate these systems remains little understood. Advances in this area await such research.

2. *Comparative Research among Species.* Ethological analyses of the influence of substance use on aggression provide comparisons of the effects of intoxication on behavior of different species. In a survey of research on controlled laboratory experiments with animals, Miczek and Thompson (1983) reported that amphetamines, PCP, and ethanol increase attack and threat behaviors in specific species, with each substance producing behaviorally distinct effects. They also reported that THC (a cannabis-based substance) and opioids appear to have selective antiaggressive effects. Their survey included several paradigms often used in animal research on aggression, with variation in the dimension of aggression (e.g., defensive or attack behaviors), the stimulus (resident-intruder, shock-induced aggression, brain stimulation, predatory aggression), and measurement of behavior (e.g., bites, gestures, vocalizations).

Phencyclidine has received little attention in controlled experiments with animals; the few studies offer conflicting evidence between species. In one experiment involving monkeys, PCP led to apparently inappropriate social behavior, producing aggression by nondrugged members against drugged animals in the setting (Miller, Levine, and

Mirsky 1973). Alcohol's effects on aggression have been studied widely on different animal species and in varying experimental circumstances. For example, high doses of alcohol decreased defensive biting and postures in mice and monkeys, while low doses seemed to enhance aggression in other circumstances (Miczek and Thompson 1983). Also, low alcohol doses increased aggressive postures and other acts characteristic of rat aggression among dominant rats confronting subordinate opponents, but higher doses had the opposite effect.

Miczek and Thompson cite several studies that illustrate that the introduction and continued administration of opiates suppress aggressive behaviors among various species and in several settings. However, when morphine is given regularly and then withdrawn, several animal species exhibit nonspecific aggressive acts such as posturing and biting random targets (e.g., Gellert and Sparber 1979). These effects seem to be further mediated by the contributions of endogenous opioids such as naloxone or maltrexone, substances that affect the opiate receptors in the brain.

The pharmacological effects of substances also seem to affect social behaviors among animals that also are associated with aggression. For example, substances that induce changes in an opponent's behavior may result in increased aggression by a drug-free attacker. Thus, defensive-aggressive behavior in reaction to attack may be suppressed by specific drug treatment of the defender. In other words, intoxication may lead to the alteration of a victim's behavior, and, in turn, may increase its risk of attack. This was found for several substances in intruder-resident paradigms, including PCP, methamphetamine, and THC (Miczek and Thompson 1983), and often stands in sharp contrast to the effects of the same drugs administered to resident attackers.

The pharmacological effects of drug administration on aggressive behavior in these experiments suggest specific causal linkages among various species. However, the causal linkage implied by aggression among nondrugged animals toward animals whose behaviors are altered by specific intoxicants suggests the possibility of a social etiology of aggression. The social origins of such aggression suggest a fertile area for new investigation.

3. *Endocrinological Research.* Cicero (1983) reviewed the literature on alcohol-induced disturbances on the hypothalamic-pituitary-gonadal system among males and its contributions to aggression and sexual activity and found an overall decline in reproductive endocrinology in both male humans and animals. However, Cicero is critical of the

popular acceptance of the influence of alcohol on aggression and sexual arousal, since alcohol's effects on endocrine secretions are paralleled by alcohol's effects on other glandular, metabolic, and physiological functions that influence behavior. Moreover, Cicero found that the failure objectively to measure aggression or sexual arousal in most studies involving endocrinological mediators, and the inability in experimental studies to disentangle psychosocial factors,³ makes it impossible to conclude that alcohol-induced changes in endocrine states (including testosterone levels) can increase sexual behavior or aggression. Cicero found no evidence that alcohol or hormonal activity dictates the display of aggressive behavior or sexual arousal in a direct fashion.

Langevin et al. (1988) failed to detect significant differences in testosterone levels among aggressive sex offenders who abused alcohol or drugs, despite a correlation between amounts of alcohol consumed and the degree of force used in the sexually aggressive acts. Mayfield (1983) concludes that the contributions of intoxication to the testosterone-aggression relation are inconclusive since the relation is quite broad, while the alcohol-testosterone relation is mediated by dose-response factors.

There has been little research on endocrinological changes that result from intoxication from substances other than alcohol. Recently, Schuckitt (1988) examined the effects of anabolic steroids on social behaviors. Steroids are not intoxicants but have been reported widely to have behavioral effects following prolonged use. Steroids appear to reduce testosterone production and, in turn, produce hormones more closely resembling the female hormone, estrogen. According to Schuckitt's interviews with weight lifters, 10 percent of the sample reported feelings of aggressiveness and irritability following prolonged use.

Hormonal changes from opiate addiction were examined by Mendelson et al. (1975), who found short-term dose-related effects of both heroin and methadone in the suppression of testosterone levels. Testosterone levels returned to normal after two months or longer of methadone treatment, indicating tolerance develops following initial changes in endocrinological functions. Woody et al. (1983) examined hostility and anxiety among opiate addicts, based on changes in endocrinological factors that are associated with anxiety. They found higher anxiety and hostility among addicts during drug-free periods, and reduced levels during methadone maintenance. Testosterone levels were

³ Specifically, expectancies, drinking contexts, and social controls.

suppressed during periods of addiction (or maintenance), and their increase following detoxification also was associated with increases in hostility and anxiety. Accordingly, Woody et al. (1983) conclude that opiates may alter levels of other endocrinological activity which, in turn, affect hostility or anxiety.⁴

Finally, Mayfield (1983) examined the relations between alcohol consumption, increases in noradrenergic activity (e.g., adrenalin release), and aggression. Noradrenergic activity is associated with readiness for a fight or flight. Despite ample evidence that alcohol ingestion increases norepinephrine levels, there are no data to link such events to increased aggression.

4. *Genetic Predispositions.* Despite numerous suggestions of a genetic predisposition to pathological alcohol intoxication or similar sensitivity to opiate addiction (based on recent studies of deficits in natural opioids and hypersensitivity in opioid receptors), there is no evidence of a genetic predisposition to an intoxication-aggression relation. Maccoby and Jacklin (1974) found evidence of genetic predispositions to aggression among males. The consistent evidence in cross-cultural and subspecies studies shows that males are more aggressive than females. Their review also showed that male aggression is evident early in life and, among nonhuman primates, aggression is related to the concentration of testosterone. Eron, Walder, and Lefkowitz (1971) suggest that violent parents produce violent children (Widom 1989). However, there has not been systematic research to disentangle genetic predispositions to *drug-* or *alcohol-induced* aggression. Moreover, empirical tests of such a relation might be beyond the limits of social or laboratory experimentation.

B. Psychopharmacological Perspectives

Historically, intoxication and aggression have been associated in both popular images and behavioral science. Early formulations of the relation between substance use and aggression focused on the changes in behavior that resulted from ingestion of intoxicants. There have been numerous reviews of the empirical evidence of relations between aggression and alcohol, PCP, opiates, barbiturates, and cocaine (Tinklenberg 1973; Pernanen 1976, 1981; Gandossy et al. 1980; Collins 1981;

⁴ Not only may this be related to aggression but it also may provide an internal stimulus for a return to opiate use (or use of other substances to reduce anxiety) following detoxification or cessation. This has clear implications for understanding the biological bases of relapse among opiate addicts.

Watters, Reinerman, and Fagan 1985). Each concluded that there is a remarkably strong association but no conclusive evidence to establish either a causal direction⁵ or mediating linkages. Psychopharmacological theories provide a convenient framework for explaining this widespread association.

Psychopharmacological theories differ from pharmacological perspectives. Pharmacological theories suggest that intoxicants have direct psychoactive effects on behavior independent of intervening psychological processes. Behavioral change following intoxication results from changes in physiological response, intensified primary drives such as sex, food, or aggression, or activation of specific brain functions or dysfunctions. These theories view the intoxication-aggression relation as exclusively biological. Psychopharmacological perspectives also differ from psychological perspectives, which regard intoxication as activating the psychic processes that are casually linked to aggression: personality factors, psychological predisposition to aggression, or pathologies. They presume that individuals' psychological predispositions precede intoxication, and intoxication is viewed as either a manifestation of these predispositions or as servicing a more significant personality dynamic (Mayfield 1983).

Psychopharmacological perspectives marry these two views of the interaction of psyche and substance and also attend to the inherent weaknesses in the separate explanations. Specifically, this perspective rejects explanations of aggression based on the psychoactive properties of substances. Rather, this perspective suggests that following ingestion of intoxicants, individuals may exhibit aggressive behaviors that result from effects of intoxicants on personality and affective states.

For example, Wikler (1952) found that alcohol had a weak and inconsistent pharmacological effect, although behaviors would emerge during alcohol intoxication that did not appear under any other circumstances. Yet aggression was rarely associated with alcohol intoxication. Wikler concluded there was no basis for a purely pharmacological explanation of the alcohol-aggression association. When Wikler compared alcohol and opiates, he found that opiates had a stronger pharmacological "signature" than alcohol. Yet there was equivocal evidence of an

⁵ There is conflicting evidence to suggest that substance use may cause violence, violence may cause substance use, that a reciprocal relation exists between the two phenomena, that shared "third" factors cause the two behaviors (i.e., that they are spuriously related), or that they are simply correlated without any significant shared causal linkages (Watters, Reinerman, and Fagan 1985).

association between opiate use and aggression, usually based on behavior evidenced during withdrawal. Once again, Wikler concluded that other factors were necessary to explain the association between intoxication and aggression.

For alcohol, the dose-related association with aggression suggests that the relation might be strongest at the extreme manifestations of alcohol use. This generally acknowledges that the association is not idiosyncratic but is associated with a pattern of alcohol use. Under such circumstances, the paradigm of pathological intoxication suggests that long-term ingestion of high doses of substances may induce psychological pathologies that are activated by alcohol. However, this association also suggests possible interactions between dosage and habituation in relation to effects on aggression.

The general paradigm for studying this association is dose-control experiments comparing subjects with different violence histories. For example, Maletsky (1976) reported significantly higher violence rates among alcohol-intoxicated subjects with prior violence, compared to rates for nonviolent subjects, but only at higher doses. Maletsky concluded that alcohol activated psychological pathologies that were not manifested during periods of sobriety.⁶

Illicit and licit substances other than alcohol are also associated with aggression, though some have no association. Marijuana and opiate ingestion suppress hostility and aggression, though withdrawal from long-term opiate use is consistently associated with irritability, hostility, and other affective symptoms. Barbiturate use appears to have the strongest relation to aggression. Collins (1982) found that aggravated assaults and robberies among treatment clients in the year preceding admission were highest among barbiturate users. Tinklenberg (1973) identified barbiturates as the drug most likely to enhance assaultiveness among incarcerated juvenile offenders. Lion, Azarte, and Koepke (1975) induced a "paradoxical rage" reaction in experimental studies with patients in psychiatric facilities. The "paradox" involved the man-

⁶ This paradigm also addresses a major weakness in experimental studies focusing on the alcohol-pathology-aggression association: the use of subjects (primarily university students) drawn from the minimal range of a behavior whose distribution is highly skewed. Moreover, the dose levels in these studies produce only mild conditions of intoxication, again not approaching what Mayfield (1983) and, earlier, Wikler (1952) termed the conditions of pathological intoxication. Mayfield goes on to describe the conundrum of researchers who require appropriate subjects for research within this paradigm, yet in settings where the risks to subjects and experimenters are far greater than the traditionally milder settings and behaviors of the traditional experimental setting.

ifestation of rage following ingestion but in the absence of other signs of intoxication.

Amphetamine use also has been associated with aggressive behaviors. Ellinwood (1971) and Asnis and Smith (1978) reported high rates of amphetamine abuse in incidents of assault and homicide. However, there appears to be little evidence to establish a psychopharmacological link between amphetamine use and aggression. Mayfield (1983) reports that amphetamine use stimulates noradrenergic activity and increases general levels of arousal and that long-term use may produce paranoid psychosis with some regularity. However, there is little experimental evidence of aggression resulting from either short- or long-term amphetamine abuse. Among delinquent boys, Simonds and Kashani (1980) reported that amphetamine use had a weaker correlation with crimes against persons than did several other substances.

Phencyclidine has also been associated with aggression, particularly assaultive behavior (Simonds and Kashani 1979, 1980). However, its effects are highly idiosyncratic and unpredictable. Feldman, Agar, and Beschner (1979) examined PCP use in six cities comparing ethnographic data from local researchers. They found that behaviors under PCP were mediated not only by sociocultural factors but also by geographic region.

Frequent and high levels of cocaine use similarly have been associated with a variety of personality disorders. Washton, Gold, and Potash (1984) reported findings from a study of seventy upper-income users⁷ who had contacted the 1-800-COCAINE hotline. Nearly two in three callers (65 percent) reported paranoid feelings, and 87 percent reported depression. However, these high levels of adverse reactions are likely to be attributable to the self-selected sample of help-seekers who had sought advice for their drug problems. Small clinical samples (e.g., Spotts and Shontz 1980) also found that paranoid ideation was a common problem. Again, though, those seeking treatment differ significantly in their patterns of use and reactions to cocaine and cannot be generalized to the broader population of cocaine users (Chitwood and Morningstar 1985; Erickson et al. 1987). For example, low-dose cocaine users report being high as a "mellow" and positive experience (Goldstein et al. 1987). However, this depends in part on route of ingestion (smoking, intravenous injection, or nasal inhalation) (Siegel 1980, 1982a).

⁷ Incomes over \$50,000 annually in 1982-84.

Erickson et al. (1987) surveyed 145 adults in Ontario about the frequency of their cocaine use and reactions. Overall, about one in six (17 percent) reported becoming violent or aggressive after using cocaine. About one in three frequent users reported feelings of aggression, compared to 20 percent of intermediate users and 10 percent of infrequent users. Factor analyses indicated that aggression and paranoia reactions formed a single dimension of cocaine reactions, though the differences by frequency of cocaine use for the factor score were not significant. However, the differences were positively related to the combined use of alcohol and cocaine, and inversely related to social class. Goldstein et al. (1988), relying on drug users' self reports, found that the frequency of cocaine use is associated with a greater likelihood of involvement *as a perpetrator* in violent behaviors.

Recent indications of frequent pharmacologically induced violence associated with use of "crack" cocaine, a smokable cocaine derivative that produces a nearly instantaneous and intense high, are based on reports from treatment populations and anecdotes conveyed in the mass media. To date, there has been no systematic research linking crack cocaine use with increased violence. However, there is evidence of a sudden and precipitous depression following crack use, leading to anxiety and depression (Washton and Gold 1987). While aggression has been reported among crack users following intoxication and withdrawal (Bourgeois 1989), it appears to conform with an economic-compulsive model of drug-related violence (Goldstein 1985), rather than a pharmacological response.

Accordingly, there is empirical evidence of a psychopharmacological basis for aggression following intoxication only for alcohol and cocaine. Only in the alcohol studies and in very few studies with cocaine were there experimental investigations of psychodynamic processes or pathologies that were posited as causal mechanisms. Despite empirical evidence that other substances may produce such behaviors, none of the studies with illicit or prescription drugs were experimental. They relied on cross-sectional designs and a general analytic model comparing users and nonusers or the coincidence of psychological pathology and aggression and often were confounded by expectancies and social context. Moreover, they neither explicitly hypothesized nor examined specific causal links between substance use and aggression.

However, research on the pharmacological treatment of psychiatric disorders where aggressive behavior also is manifested suggests a psychopharmacological basis for the intoxication-aggression relation.

Kramer (1983) reviews evidence from clinical treatment that shows that the pharmacological treatment of aggression may be accomplished by the treatment of more general psychiatric disorders, of which aggression may be a manifestation. These include mania, major depression, schizophrenia, organic mental disorders that produce episodic dyscontrol, and seizure disorders. However, it is not certain whether the pharmacological agents are suppressing the behaviors or acting on the psychiatric disorders. For example, Bell (1972) reports that the chlorpromazine treatment of amphetamine intoxication can reduce not just paranoid ideation but also cardiovascular effects following intoxication. But in these tests, the researchers do not distinguish the competing effects of the physiological and psychiatric manifestations of the substances and their reduction in curbing aggression. Nor do these studies always measure aggression or violence, more often either excluding or confounding these two behaviors. Instead, the studies cited by Kramer *assume* that the psychiatric state includes an aggressive behavioral manifestation, and, in turn, that the treatment of the disorder also will suppress aggression. Though Kramer identifies an important paradigm for explaining the intoxication-aggression relation, experimental evidence is needed to sort out the physiological and psychopharmacological effects of the treatment drugs.

C. Psychological and Psychiatric Perspectives

The psychopharmacological perspective on the intoxication-aggression relation posits direct effects of substance use on behavior. In contrast, psychological perspectives link intoxication to changes in personality or psychopathological factors that may be associated with aggression. Since alcohol or drug use does not lead inevitably to aggression, psychologists have turned to individual and conditional relations (between personality and social context) to explain aggression among a relatively small proportion of substance users. Various theories of personality and cognition suggest contradictory perspectives on the effects of substance use on the emotional and personality dynamics associated with aggressive behavior.

For example, there is evidence that alcohol or other psychoactive drugs may either dampen or intensify emotions such as hate, rage, or contempt that often accompany aggressive behavior. There also is evidence that substance use may either suppress or deny certain emotions that may precede aggressive behavior, for example, shame or guilt. Rather than a stimulation of aggressive behaviors, alcohol or drug use

may also be a “defense” to excuse or justify behavior, or to deny responsibility for aggression. Still other perspectives suggest that the effects of substances on personality factors are not psychoactive but are social in origin. That is, certain emotional correlates of aggression—shame, guilt, rage—which are stimulated by substance use may result from the social processes of substance abuse. Substance use also may be spuriously related to psychological processes that underlie aggression. For example, both aggressive behaviors and substance use (particularly alcohol abuse) arise from severe family pathology (McCord 1988). This brief overview suggests several competing and conflicting hypotheses on the complex relations among substance use, personality or psychopathology, and aggression.

Research strategies also vary within this set of explanations. The general theoretical model for studying the substance use-aggression relation suggests that intoxication conditionally affects either personality variables or psychodynamic processes which, in turn, are associated with aggression. At the extremes of aggressive behavior, the clinical study of psychopathology relies on small clinical samples and often idiographic approaches to assign theoretical meaning to observations with individuals or small groups. Cross-sectional studies with general populations or populations “at risk” provide opportunities to test the hypothesized associations between personality variables, substance use, and behaviors. Longitudinal studies have been used to examine the causal order of substance use and aggression and attendant hypotheses regarding psychological processes. Experimental studies also have been used both to standardize measurement and to control interactions between victims and aggressors—that is, to provide direct controls on stimulus while covarying personality variables through sampling. The majority of experimental and clinical studies of psychological variables have examined the effects of alcohol. The discussion in this section reflects this imbalance in empirical research.

1. *Personality Development and Emotions.* Studies of patients in intensive and lengthy psychotherapy suggest psychodynamic processes that link aggression and substance use. Pihl (1983) and Wurmser and Lebling (1983) suggest several types of relations among personality factors, substance use, and aggression. They are illustrated in the Appendix. Most (93 percent) of the studies tested personality concepts with clinical (treatment) samples, and fewer than half (47.4 percent) had control groups (Pihl and Spiers 1978). The results have contributed to the tendency to assign a causal role to personality disorder in a hypothetical

causal sequence leading to aggression. But evidence from clinical samples tells us more about individuals who reach treatment programs and how they are labeled than about aspects of intoxication or aggression. Typically, these studies use measures that rarely are linked theoretically to aggression.

Research on psychoanalytic theories of aggression and substance use has involved three theoretical frameworks. One class of theories suggests that personalities predisposed to substance use also suffer from severe conflicts that produce aggressive behavior. Substance use either dampens or strengthens these conflicts. Accordingly, this formulation states that substance use intervenes in the relation between personality and behavior. A second class of theories suggests that personality factors that are associated with aggression are also related etiologically to substance use. That is, substance use and psychopathology are related spuriously. For example, the antecedents of family dysfunction may produce both aggression and compulsive or pathological intoxication. A third perspective suggests that the personality traits of aggression are antecedents of substance abuse behaviors and that substance abuse "serves" the interests of aggression for these individuals.

a) *Intoxication Strengthens or Dampens Emotional States Associated with Aggression.* In this framework, intoxication affects the motivation for or restraints against aggressive feelings. This hypothesis is the basis for the widely discredited "disinhibition" hypothesis (Room and Collins 1983; Reinarman and Critchlow-Leigh 1987; Collins 1988, 1989).⁸ Both psychoanalytic experience and experimental evidence underlie this proposition. Alcohol, stimulants, and psychedelics may neutralize moral or emotional restraints that, in a sober state, effectively control aggression. Wurmser and Lebling (1983) cite case studies in which cocaine and methedrine enhanced patients' feelings of power and control and, in turn, diminished feelings of helplessness and dependence. However, when feelings of loss of power or control were evident, depression and fear set in. Aggression in these circumstances was either external (sexual aggression, intimidation, or interpersonal violence) or internal (sado-masochism, suicidal ideation, or attempts at self-harm).⁹

Alternately, Wurmser and Lebling (1983) cite reports from other patients that intoxication numbed aggressive feelings associated with

⁸ The debate over this hypothesis is analyzed in detail in a later section which reviews several contemporary views and explanations.

⁹ One patient reported that alcohol actually increased the threshold of physical pain she could endure, allowing aggressive behaviors to become more salient and endurable.

personality disturbance. Typically, barbiturates and opiates were reported as anesthetics against feelings of rage, despair, or loneliness. Stimulants, psychedelics, and alcohol were used to offset feelings of depression, guilt, shame and weakness, or vulnerability. There appear to be characteristic correlations between the drug chosen, emotional state, and the type of affect sought. Rage, shame, and loneliness seem to be characteristic of patients who are narcotic users and may be associated with aggression when users are not intoxicated. Stimulants and alcohol, conversely, seem to be used by patients seeking to enhance emotional states which serve aggressive purposes. Accordingly, the psychopharmacological effects of specific drugs appear to be consciously monitored in the selection of substances to intervene in the dynamics of the personality-aggression relation.

In psychoanalytic terms, intoxication defends the ego against the superego's efforts to resist the neutralization of values, authority, temporal perceptions, and control or delay of gratification. This is one hypothesis for the effectiveness of treatments that provide substitute conscience figures such as Alcoholics Anonymous and its derivatives (e.g., Narcotics Anonymous). Transference in psychotherapy serves a similar purpose. These external authorities either temporarily suppress or outweigh the emotional or ego states that are evident in the intoxication-aggression dynamics (Kubie 1963, cited in Wurmser and Lebling 1983).

b) Substance Use and Aggression Share Common Antecedents. Research on causes of both aggression and pathological intoxication or addiction has identified shared antecedents, especially family pathology and early childhood victimization experiences. Wurmser and Lebling (1983) emphasize the essential role of violence and sexual overstimulation in the family background in more than half the substance abusers in psychotherapy. Early childhood victimization by one's parents is thought to generate acute feelings of powerlessness that result in later loneliness and alienation, precursors to self-victimization as an adult. The specific sequence leading to aggression and addiction begins with anxiety and conflict from the suppression of rage (against the victimizer) and guilt (from evoking parental anger and disapproval). The developmental deficit fuels the twin reactions of addiction and aggression.

Other views on personality suggest a developmental perspective, where gaps in cognitive and emotional skills may lead to "problem behaviors." Jessor and Jessor (1977) identified deficits in personality

development leading to both aggression and substance use during the transition from adolescence to adulthood. They cite “problem behaviors” by young males in this period as evidence of a strain resulting from a discrepancy between social role expectations and personality development. “Problem behaviors” include both substance abuse and aggression, especially their joint occurrence. Fagan et al. (1987) suggest that these behaviors reflect weak development of social judgmental skills for analyzing ambiguous moral situations or managing emotional responses to complex social cues. This developmental period also has been cited as a period of vulnerability to compulsive masculinity that contributes to aggression and drinking (McClelland and Davis 1972). Kohlberg (1973) cites weak moral development as an antecedent of both aggression and substance use.

c) *Does Aggression Precede Substance Use, or Does Substance Use Precede Aggression?* Longitudinal research provides empirical evidence to disentangle the effects and antecedents of compulsive substance use. For example, Robins (1979, 1984) has made important contributions to the study of the natural histories of addiction and adolescent substance use. McCord (1983, 1988) followed subjects in the Cambridge-Somerville Youth Study (Powers and Witmer 1951), begun in 1936, for four decades and examined antisocial behaviors including alcohol use and criminal activity. Subjects were classified during childhood as aggressive or nonaggressive based on teacher evaluations at seven to eight years of age, well before their initiation into substance use. At follow-up, subjects were classified as alcoholic ($N = 107$) or nonalcoholic ($N = 283$), and information was collected about their criminal activity from official records. About half the alcoholics (47 percent) had been aggressive youngsters, compared to 40 percent of the nonalcoholics. Accordingly, there was no conclusive evidence that aggression preceded alcoholism.

The results showed that aggressiveness in childhood predisposed subjects to adult criminal behavior, and that alcoholic subjects were convicted of more crimes regardless of their early childhood aggressiveness. Moreover, alcoholism and early childhood aggression were associated with different forms of adult aggression. Alcoholic subjects who were aggressive during childhood more often were convicted of interpersonal crimes as adults than nonalcoholic subjects. In other words, early childhood aggressiveness and alcoholism as an adult were found to interact and predict the highest levels of interpersonal violence.

The McCord study makes a singular contribution in its multidecade span. However, it relies more on the classification of early childhood behaviors than assessment of personality variables that might influence aggression as a child and thereby overlooks alternate views of the development of aggression in childhood. This is typical of longitudinal studies that seek to disentangle the sequence of behaviors between intoxication and aggression. Unfortunately, few other studies have examined the temporal order of aggression and substance use, much less other etiological factors, and accordingly the causal mechanisms remain tangled. There are a few exceptions, however. Greenberg (1977) reviewed empirical research on amphetamine abuse and violence. She found consistent evidence that delinquency preceded amphetamine abuse. Collins, Hubbard, and Rachal (1985) suggested that criminal violence preceded certain types of substance use among adults. Unfortunately, problems of accurate recall of temporal order or specific experiences in most retrospective studies pose threats to the validity of their results.

d) Substance Use and Aggression Are Spuriously Associated. Numerous researchers have suggested that the intoxication-aggression relation is spurious rather than causal, especially among adolescents (see the literature reviews in Elliott and Ageton 1976; Gandossy et al. 1980; Collins 1981; Inciardi 1981; and Watters, Reinerman, and Fagan 1985). In this view, a "third factor" or common cause underlies both crime and drug use. Longitudinal studies have been unable to establish conclusively a causal ordering and may interpret as causal what may actually be reciprocal relations. Several longitudinal studies (Johnston, O'Malley, and Eveland 1978; Elliott, Huizinga, and Ageton 1985; Kandel, Simcha-Fagan, and Davies 1986; White, Pandina, and LaGrange 1987) found little evidence that drug use either precedes or follows crime, only that they tend to co-occur and are associated in frequency and severity.

There also seems to be considerable variation in the strength of the drug-violence association, with simple correlations ranging from 0.4 to 0.6 (Clayton 1981). Thus, over 60 percent of the variance in drug use and criminality is not shared by a common set of etiological factors. White, Johnson, and Garrison (1985) analyzed longitudinal data from a probability sample of New Jersey adolescents through eighteen years of age. They report even lower correlations (0.2 to 0.4) when controlling for severity of use, with gender and age differences between middle (fifteen years of age) and later (eighteen years) adolescence. And crime variables added less to predictions of substance use than substance use

did to predictions of crime, suggesting that the relation may be asymmetrical: there may be more drug users who avoid crime than delinquents who avoid substance use.

Accordingly, there is little doubt that adolescents who drink or use drugs are more likely to commit violent acts than are those who avoid substance use. Among delinquents, the probability of more frequent and severe¹⁰ drug use increases with the severity and frequency of violent delinquency (Johnson et al. 1986*b*). Yet consensus on the intoxication-aggression relation among adolescents seems to end there.

2. *Experimental Studies.* Direct, systematic experimental studies of the effects of intoxication on aggression provide further evidence of the complexity of the association. These studies generally occur within a laboratory setting where the experimenter monitors aggressive behavior that may occur following controlled (and manipulated) interactions between an aggressor and a potential victim. Measurement of aggression requires a valid index of aggressive behaviors. Intoxicants are given in varying doses to the potential aggressor, often in a double-blind condition. The amounts are almost always less than the threshold for sensory impairment (drunkenness). Subjects are nearly always male college students.

Taylor (1983) summarized the results of research using two major experimental models: the teacher-learner paradigm and the competition paradigm. Conclusions about the strength and nature of the relation varied by experimental model used and several design characteristics. In the teacher-learner paradigm, the subject, or teacher, helps the learner, who is engaged in a memory task, by administering electric shocks of varying intensities when the learner makes a mistake. The competition paradigm allows a subject to commit aggressive acts against an opponent during competition in a reaction time test.¹¹ Taylor described this method succinctly:

¹⁰ Use of drugs other than alcohol or marijuana, specifically hallucinogens, opiates, cocaine, barbiturates, amphetamines, or PCP.

¹¹ One might rightfully wonder about the human subjects procedures in these experiments. Subjects are informed about the procedures involved, including the potential for receiving electric shocks. The discomfort is compared to pain encountered in daily routines, such as a pinprick or a mild burn from a hot kitchen surface. Subjects are told they may terminate their services at any time, without penalty. They are asked to sign a statement acknowledging that they have had some previous experience with alcohol, or the substance to be investigated. They also authorize their medical records to be examined to rule out participation where medical conditions so indicate. To consume alcohol, subjects place a small amount of crushed ice in their mouths and consume two drinks, fifteen minutes apart. Each drink consists of the alcohol (100 proof), a quantity of ginger ale that is 1.5 times the amount of the alcohol, and peppermint oil to mask the taste.

Prior to each competitive trial, the subject, and presumably his opponent, is signaled to select the intensity of the shock he wishes to administer to his competitor. The subject and his opponent then compete on a reaction time trial. The person with the slower reaction time receives the shock that had presumably been selected by his competitor. The person with the faster reaction time does not receive a shock; however, he is informed, by means of feedback lights, of the intensity of the shock his opponent had set for him. Thus, the subject realizes that either he or his opponent will receive a shock, depending on the outcome of the competitive trial, and that each can select the intensity of the shock the other will receive. In actuality, the opponent is simulated. [Taylor 1983, p. 281]

Several studies using the competition paradigm suggest that intoxicated subjects behave more aggressively than nonintoxicated subjects. Shuntich and Taylor (1972) reported that intoxicated subjects behaved more aggressively than did subjects who either consumed a placebo or had no beverage at all.¹² Taylor and Gammon (1975) replicated this experiment, varying the quantity of alcohol consumed. Their results indicated there is a positive and linear association between aggression and the quantity of alcohol consumed. Accordingly, Taylor (1983) suggests that there initially appears to be a relation between alcohol and aggression.

Other studies sought to determine whether similar associations were evident for the effects of marijuana (considered to have hallucinogenic effects) or diazepam, a minor tranquilizer, generally classified as a central nervous system suppressant. Taylor et al. (1976) found that high doses of delta-9-tetrahydrocannabinol (THC) did not produce aggressive responses. The high-dose THC condition tended to suppress aggression. Myerscough (1980) replicated the Taylor et al. study, but with a higher maximum dose of THC and a highly provocative (simulated) opponent.¹³ Only subjects in the low-dose condition showed aggressive behavior over the two control conditions and were

Thirty minutes after the last drink, the subject is taken to the area where the experiment proceeds.

¹² The no-beverage controls and the placebo groups did not differ in their shock settings.

¹³ The simulated opponent set intense shocks and, on two occasions, attempted to deliver a shock that was twice as strong as the pain threshold.

also the only ones to retaliate against the provocative opponent. Pagano (1981) compared the effects of high and low doses of diazepam to both a placebo and a nonintoxicating condition. Diazepam, a central nervous system depressant, increased subjects' aggression, but only at high dosage.

Research using the teacher-learner paradigm produced quite different results, suggesting that the intoxication-aggression relation is mediated by social and environmental factors. This is the basis for rejection of the simple disinhibition hypothesis, a form of psychopharmacological determinism that, until recently, was uncritically accepted to explain the intoxication-aggression relation. Factors such as threat, learned social responses, and expectancy have been shown empirically to mediate the intoxication-aggression relation.

Bennett, Buss, and Carpenter (1969) found no relation between alcohol consumption and aggression, contradicting the Shuntich and Taylor (1972) results obtained using the competition paradigm. Analyzing the differences between these studies, Taylor, Gammon, and Capasso (1976) suggested that differences between the paradigms explained the discrepancy. They argued that the teacher-learner paradigm is inherently nonthreatening since the learner cannot retaliate. But in the competition paradigm, opponents not only can retaliate but also initiate physical attacks.

Taylor and colleagues tested this hypothesis by having subjects compete with a silent or active opponent. The silent opponent was considered to be nonthreatening, and even went so far as to audibly say to the experimenter, within earshot of the subject, "I have strong convictions about hurting people and I'd feel more comfortable about this thing if I just set the 'one' button all the time" (Taylor 1983, p. 285). Intoxicated subjects behaved more aggressively than the sober subjects but only under the threatening conditions. Taylor, Gammon, and Capasso concluded that aggression is not simply a pharmacological effect of ingestion of alcohol but instead results from the interaction of consumption and threatening environmental cues.

In later experiments, Sears (1977) and Taylor et al. (1979) each modified this experimental framework. Results were consistent with the earlier studies: intoxicated subjects still behaved more aggressively. Taylor et al. (1979) allowed subjects actually to see an opponent attempt to harm him, making the threat real rather than potential. Sears used social cues conveyed verbally by peers, instead of potential threat, to instigate aggression. Finally, Taylor and Gammon (1975) found that

intoxicated subjects also were receptive to social pressure to *reduce* shock, even when opponents administered intense shocks.

Accordingly, both threat and other instigative cues interacted with intoxication to produce aggressive responses in a competition paradigm. The absence of aggression in the noninstigative conditions provides strong evidence to dismiss disinhibition models based on either physiological or psychopharmacological processes. However, not all theories of disinhibition are based on psychoactive or physiological responses. The learned disinhibition model suggests that the effects of alcohol are learned rather than physiologically determined, and that subjects who consume alcohol simply behave consistently with their expectancy that intoxication will instigate aggression. That is, belief that one is intoxicated is itself a cue for specific aggressive behaviors. (Also, see Briddell et al. 1978, regarding sexual arousal).

In experimental conditions, learned disinhibition suggests that those who consume a placebo which they believe to be alcohol should become more aggressive than those individuals who do not believe they have consumed alcohol, independent of dose. Moreover, since the belief that one has consumed alcohol is the critical condition, aggression should be constant for those who believe they have not received alcohol, regardless of whether, in fact, they receive placebos or varying doses of alcohol. Taylor (1983) reports several studies that contradict the learned disinhibition hypothesis (Shuntich and Taylor 1972; Taylor and Gammon 1975; Zeichner and Pihl 1979, 1980). Taylor (1983, p. 228) concludes that the evidence "provides strong support for a model that assumes that neither the pharmacological effects of alcohol, nor cues in the drinking situation, can independently account for the aggression expressed by intoxicated persons. In the absence of instigation, alcohol consumption has not been shown to increase aggressive responding. However, in the presence of instigative cues, alcohol has been reported to facilitate intense aggression. While these instigations were only minimally effective in producing aggression among sober subjects, they were very effective among intoxicated subjects."

Instead, it appears more likely that alcohol influences the perception or attribution of threat (Taylor, Gammon, and Capasso 1976; Schmutte, Leonard, and Taylor 1979). Boyatzis (1977) cites evidence that alcohol affects the same physiological processes stimulated during an aggressive encounter, an endocrinological effect. Both Moyer (1983) and Vogel (1983) suggest that this process decreases the threshold of provocation or stimulation for aggression.

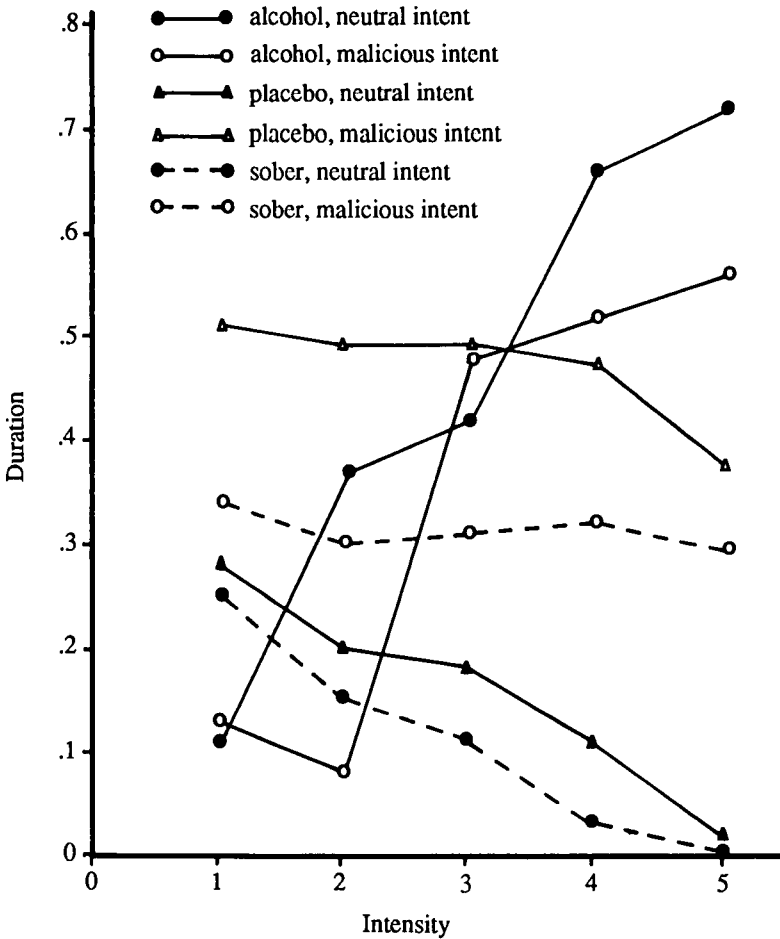


FIG. 1.—Mean shock duration (seconds) at five shock intensity levels in alcohol, placebo, and nondrinking (“sober”) groups. Source.—Zeichner (1980), cited in Pihl (1983), p. 297.

Zeichner and Pihl (1979, 1980) reported evidence confirming a corollary hypothesis: intoxication reduces the ability to perceive the negative consequences of an aggressive act or at least interferes with individuals’ abilities to process information about behavioral contingencies. Again using a competition paradigm, they found that intoxicated subjects more often failed to consider the possible consequences of their behavior, and responded aggressively to provocations regardless of the level of retaliatory threat. Figure 1 illustrates the significant effect of alcohol (compared to a placebo) on shock administration and also the interac-

tion of provocation (malicious or neutral), expectancy, and substance. Russell and Mherabian (1974) found that increased risk taking occurs during intoxication, indicating that judgments about contingencies and consequences alter rather than simply impair.

Accordingly, these studies suggest that intoxication either intensifies or diminishes perceptions of the social contexts of drinking situations. That is, they suggest the presence of mediating cognitive and emotional mechanisms that qualify the intoxication-aggression relation. Specifically, the effects of anticipation or expectation on aggressive responses to intoxicants have important implications for understanding the occurrence of violence following substance use. Unfortunately, the preponderance of experimental research has examined the effects of alcohol as an intoxicant; empirical evidence from experiments with other substances is simply not available or lacking in rigor.

3. *Summary.* The results of both psychoanalytic and experimental studies suggest that intoxication is associated with aggression but that cognitive and emotional states mediate the intoxication-aggression relation. Moreover, the association is substance specific, with evidence available that some substances suppress aggression while others intensify either the behavior or its emotional or cognitive antecedents. The preponderance of empirical studies have examined the effects of alcohol, most often with subjects drawn from college student pools, and they suffer from marked intrasubject variability. The paradigms employed may be artifactual and fail to simulate credible social contexts. Nevertheless, there is evidence of the antecedent effects of alcohol on aggression, and that expectancy also plays a significant role in the intoxication-aggression relation.

There is some evidence that alcohol in particular may increase one's preparedness to aggress, akin to a "fight or flight" reaction, or, alternatively, reduce the threshold for aggression by altering perceptions of its consequences. Aggression also is more likely to occur in response to provocation or perception of threat in specific social contexts. There appears to be little support for a neurochemical model of disinhibition, despite the evidence that aggression increases at higher doses of alcohol, or for alcohol in comparison to beer (Pihl 1983). But Pihl (1983) suggests that prior associations with alcohol may significantly influence expectancy. The expectancy relation is further modified by the social contexts in which alcohol is consumed and the beliefs of behavioral expectations in specific circumstances (Wilson and Lawson 1976; Boyatzis 1983). It is plausible that the alcohol's antecedent effects simply

reflect social cues or other social-psychological factors that are spuriously related to aggression. These factors are analyzed in the next section.

D. Social and Cultural Explanations

Empirical evidence of subcultural variation in the intoxication-aggression relation challenges theories based on chemical disinhibition. Despite evidence that intoxication may alter social judgment and arousal states, the many observations of subcultural, cross-cultural, and socially mediated variation contradict theories of intoxication-caused aggression based on biological, psychopharmacological, cognitive, or personality factors. Goldstein's (1985) important work, and subsequent empirical validation (Goldstein et al. 1988), suggests that even when there exists an intoxication-aggression relation, there are several meanings and explanations to observed patterns of substance use and aggression. Social and cultural explanations of the intoxication-aggression relation do not deny the contributions of individual factors; however, biological or psychological factors simply cannot explain the cross-cultural or subcultural variation that dominates the empirical literature on intoxication and aggression.

The evidence of social influences encompasses three broad areas: cross-cultural and subcultural studies of societies where there is conflicting evidence of aggression during intoxication; social structural patterns in the intoxication-aggression relation by race, region, age, and social class; and evidence from specific varieties of intoxication-related aggression which demonstrate the sociocultural patterns that shape these behaviors.

1. *Cross-cultural Variation.* In 1969, MacAndrew and Edgerton demonstrated that alcohol use does not lead to aggressive behavior in all cultures, but that aggressive behavior accompanies alcohol use in some cultures but not others, and that individuals may be aggressive in some situations but not others. Their study, *Drunken Comportment*, essentially dismissed the notion that the physiological effects of ethanol are the major or sole cause of aggressive behavior when intoxicated. Other cross-cultural studies have confirmed the MacAndrew and Edgerton (1969) finding. For example, Schaefer (1973) examined ethnographic reports from a probability sample of sixty small-scale and folk societies and concluded that men frequently get drunk in most (forty-six) of them but are involved in drunken brawls in fewer than one-half (twenty-four). A decade earlier, Lemert (1962) noted that drinking may

be interpreted either as a cultural pattern, a symbol of cultural stress, a symbolic protest, or a form of collective behavior. Accordingly, regardless of how substances are used, cultural meanings and practices will contribute to some degree in determining the circumstances of how people use intoxicants and how they behave afterward. Levinson (1983*b*) suggests three explanations of cultural influences that may mediate the intoxication-aggression relation: cultural norms or patterns, cultural "defense," and ethnic and subcultural determinants.

a) Cultural Patterns. The cultural pattern model rests on two broad assumptions: first, that aggressive behavior is learned and transmitted by social and cultural processes and, second, that different forms of aggression tend to co-occur (e.g., assaults, homicide, warfare). Accordingly, Wolfgang and Ferracuti (1967) sought to explain the existence of violence within subcultural groups as intrinsic to those groups, culturally legitimated in a wide range of social situations, and reproduced or passed on intergenerationally. With respect to intoxication, the cultural pattern model suggests that the intoxication-aggression relation will be strongest in subcultures or societies where aggression is normative.

Many cultures have no association between intoxication and aggression. Heath (1983) cites the Camba tribe of Bolivia, who get drunk on 178 proof rum twice a month, but who experience no verbal, physical, or sexual aggression during those periods or between them. Instead, drinking for the Camba is a welcome and necessary "time out" from the difficult routines facing these subsistence farmers. For the Camba, aggression is virtually nonexistent and hence does not occur during their predictable periods of intoxication. In contrast, the Lapps of Finland also drink in periodic binges. But fighting is commonplace and homicide is a frequent result of knife fights during their drinking episodes (Ahlstrom 1981, cited in Heath 1983). However, there is no evidence that the Lapps are particularly violent when sober. Levinson (1983*b*) links the generally higher levels of homicide and aggression in the American South to its high rates of alcohol-related aggression. Citing national surveys of drinking patterns, Levinson states that both alcohol use and violence are higher in the southern United States, calling it a pattern of "belligerent drinking."

In an earlier study, Heath (1964) cited other sociocultural factors that illustrate the culturally unique patterns of aggression while intoxicated. Heath showed the importance of individual relationships within the kinship structure of the Navajo that determine who will fight when drunk. For example, the Navajo fight exclusively within their kinship

structures (e.g., between uncles and nephews), rather than indiscriminately between members of different families within the tribe. Even within cultures, the norms and expectation of “drunken comportment” may change over time—Hill (1974) cites changes in expected behaviors while intoxicated of young Plains Indians, from “hell raiser” as a youth to a sober and gentle “family man” as an adult who avoids violence when intoxicated. Common experience tells us that, in American culture, there is less physical aggression among businesspersons than “blue-collar” workers despite the higher alcohol dose in businesspersons’ martinis than there is in the beers consumed by working-class men in neighborhood taverns.

There also is ample evidence of cross-cultural variation in the intoxication-aggression relation for other substances. Morales (1989) studied coca farmers in Peru who chewed coca leaves to increase their energy and productivity. The term “drug abuse” itself originally reflected prejudice by American southerners against black cocaine users rather than any attribution of its dangerous effects (Musto 1973; Helmer 1975). The term later was extended to opium smoking by Chinese Americans, another expression of fear against a minority who were despised at the time (Zinberg 1984). Clausen (1968) pointed out that a particular drug (in his writing, marijuana) may be accepted as part of a religious ritual in one society, an enhancement to routine social interactions in another society, and a dangerous substance in a third society. The work of Carlos Castaneda illustrates the importance of hallucinogens in spiritual observance and as religious sacraments (Castaneda 1967).

Evidently, cultural and ecological factors influence the intoxication-aggression relation. However, research has provided few valid explanations of why and how cultural factors influence the intoxication-aggression relation. Achte et al. (1969) and Room (1970) adopt a drive-discharge model to explain the Finnish aggression and American belligerent drinking in the South, respectively.¹⁴ However, comparing drive discharge and cultural pattern models, several studies have found little support for drive-discharge explanations of intoxication-related aggression (Berkowitz 1962; Straus 1974; Levinson and Malone 1980).

¹⁴ The drive-discharge model of human aggression suggests that all groups have basic aggressive instincts that must be discharged periodically (Levinson 1983a). The processes of a drive-discharge model generally include five components: ambivalence about aggressive feelings, guilt feelings about the behavior once it is initiated, authoritarian control that suppresses the expression of basic instincts or behaviors, tension or difficulty in expressing the guilt or ambivalence produced by the behavior, and expression of the frustration and rage from the pent-up aggressive feelings.

Moreover, individual variation within cultures suggests that cultural pattern models suffer from ecological fallacy limitations. Heath (1983) suggests that situational factors are necessary to explain individual variation within a culture, although the situational factors themselves are created by unique cultural processes. Heath suggests that cultural patterns of "drunken comportment" are perhaps best explained as communicating the shared values and norms of a culture or social group.¹⁵ Accordingly, aggression while intoxicated may be a social, interactive ritual with specific meaning in specific social contexts that links the participants in terms of their social roles and connections.

b) *Cultural Defense*. Many studies have shown how intoxication is used as an excuse for behavior that is socially disapproved or controlled in most contexts. MacAndrew and Edgerton (1969) use the notion of "time out" to explain how people are not held accountable for behaviors that occur while intoxicated. These cultural practices help reduce tensions and hostilities within cultures or social groups by creating situations in which it is permissible to express such conflicts. Marshall (1983) suggests three reasons why drunken aggressiveness is an efficient cultural defense. First, aggressiveness while intoxicated is widespread, both between strangers and in domestic situations. Its common occurrence suggests that it plays some useful social purpose within cultural systems. Second, feigned drunkenness often accompanies aggressive behavior. Apparently, drunken behavior is associated with a social context that is important in facilitating aggressiveness. Third, aggressiveness while intoxicated involves a highly ritualized set of learned behaviors and specific social rules that dictate the conditions for becoming intoxicated and the participants in episodes of aggression.

The ritualization of cultural defense provides participants a set of rules governing the boundaries of aggression: locations, participants, and severity. Levinson (1983*b*) suggests that ritualization of aggression during intoxication reduces ambiguity in social cues in drinking contexts and, accordingly, may help reduce random, uncontrolled violence. Thus, provocation from a *known* drunken aggressor can be interpreted appropriately and met with tactics that deflect the aggression, while *arbitrary* aggression that occurs outside accepted boundaries more often will result in violence (Pernanen 1976).

¹⁵ As an anthropologist, Heath regards behaviors while intoxicated as expressions of other social or psychological processes, what sociologists often term symbolic interactions (Blumer 1971).

Brisset (1978) cites cross-cultural evidence that individuals in various cultures around the world admit to planning asocial or antisocial acts and then drinking as an "excuse" for the behaviors that follow. A corollary of cultural defense is the concept of drinking to embolden behavior. Levinson (1983*b*) and Roizen (1983) each cite evidence that drinkers intended to alter their mood by consuming alcohol, but they did not anticipate specific behaviors that might accompany their changed mood. Vigil (1988) described how Mexican American youth gangs in East Los Angeles used PCP and alcohol to achieve a state of *locura*, where a variety of antisocial and aggressive acts could occur. Feldman, Mandel, and Fields (1985) found similar processes among Latino youths in San Francisco. However, they discovered quite opposite effects among black youths in the same city, who preferred substances that enhanced their ability to maintain reserve or *cool*, their culturally valued mood and behavior. Thus, both the *defense* (excuse) and *embolden* hypotheses view intoxicants as enablers or facilitators of certain culturally specific emotional or behavioral states while intoxicated.

c) *Ethnic and Subcultural Determinants.* There is an extensive literature on ethnic and subcultural differences in alcohol studies (Wechsler et al. 1980), and there are some studies on other substances (see Feldman, Agar, and Beschner [1979], for PCP use; and Feldman, Mandel, and Fields [1985], regarding alcohol, marijuana, and PCP). These studies focus mainly on the behaviors and problems of males while intoxicated. Levinson (1983*a*) explains ethnic differences in consumption and problem behavior patterns in terms of the extent to which cultural processes incorporate intoxication into subcultural social systems. Accordingly, where intoxication is well integrated into the rituals of a subculture, problems related to intoxication are rare. Where there exists cultural dissonance about alcohol or drug use (i.e., where it is poorly integrated), or where intoxication results from the social or economic isolation of an ethnic group, problems such as aggression and violence will be evident. The evidence of differences between Latino and black youths in San Francisco in Feldman, Mandel, and Fields (1985) also illustrates ethnic and subcultural differences.

Anomie theory (Merton 1957) suggests that deviant behavior (such as aggression while intoxicated) is more likely to occur in a situation in which individuals lack access to legitimate means to achieve their economic goals. The resulting means-ends disjunction may produce individual and social pressures to engage in alternative behaviors. Levinson

(1983*b*) suggests that excessive drinking and drunken brawling may be two common expressions, citing three studies to support this interpretation. First, Robbins (1979) found that aggressive drinkers among Naskapi men in northern Canada were men who were unsuccessful as iron miners in a mining community. Nonaggressive drinkers included those who were successful economically, and accordingly had greater access to status-conferring social ceremonies or to important goods that could be other indicators of their social status. Second, Gordon (1978) found that Dominican immigrants to the United States had greater economic opportunities after migration. The social meaning of drinking changed for Dominican immigrants when their cultural role changed in response to their new economic condition, and aggression while drinking changed in turn. They placed a greater value on discipline, sacrifice, and family. In turn, their drinking locale changed from male-only bars to their homes, often in the company of wives and relatives, and aggression decreased as their embedment in the male culture lessened.

Finally, Gordon (1982) discovered the opposite pattern among Guatemalan immigrants to the United States and attributed the differences to the absence of women in their immigrant communities compared to the Dominicans. Guatemalan immigration was confined largely to males, but Dominican *families* migrated to the United States. Thus, while Dominican men spent more time at home, Guatemalan men continued to drink in bars with other men, maintaining the social immersion in male cultures that prevailed in Guatemala, and that have been associated with violent behavioral norms among males (Bowker 1986*a*, 1986*b*).

Burns (1980) provided an ethnographic account of typical drinking behavior of male adolescents in Boston by charting the events of an evening of drinking and socializing with four young males from Charlestown, a homogeneous working-class section of the city. The displays of aggression were integral to the social bonds between the young men and included seventeen distinct aggressive acts.¹⁶ Their behaviors varied widely by type of setting. They were quiet and deferential in the local tavern with elder members of the Charlestown neighborhood. However, they were most aggressive in the "adult entertainment"

¹⁶ Loud conversation, good-natured wrestling, piling into a car, speeding, verbal boasting, verbal threatening, raucous comments, verbal disparagement, being rowdy, yelling, screaming, arguing, putting a fist through a store window, fighting, bottle crashing, threatening with a gun, and sexual aggressiveness.

neighborhoods of the downtown areas. Burns concluded that drinking served aggression and allowed them to express their masculinity, but the boys shifted their setting to a milieu where aggression was more acceptable, or where social controls were less salient. Moreover, Burns's account suggested that aggression was associated with the amount of alcohol consumed. In other studies cited by Levinson (1983*b*), the correlations between the amount consumed and aggression ranged from .28 to .42, suggesting that at least 50–70 percent of the variance in aggression while drinking is explained by other factors than the amount consumed. Yet the causal direction is uncertain—the boys in the Burns study drank beer to become aggressive, and the more they drank, the more aggressive they became.

Missing from these studies are efforts to examine interactions between cultural and economic variables. It is conceivable that cultural meanings associated with intoxication may mediate the relation between economic attainment and aggression while intoxicated. These anthropological studies generally use the occurrence of alcohol- or drug-related aggression to illuminate aspects of their subjects' social lives and their relation to the dominant cultures in which they exist. It is also likely that there is an interaction between cultural or ethnic groups and social controls regarding intoxication, factors that both impart meaning to intoxication and proscribe impermissible behaviors (Morgan 1983).

Accordingly, the cultures where aggression often accompanies intoxication are likely to vary in the cohesion or looseness of their social and economic structures (Levinson 1983*a*). Factors such as kinship structures, collective property ownership, or divisions of labor are dimensions of cultural cohesion. In cohesive cultures, not only is there economic integration of its members, but also intoxication rituals are integrated into their social rituals, and cultural and social controls are present to proscribe behavior while intoxicated. In these cohesive societies, Levinson (1983*b*) hypothesizes that few differences in behaviors exist whether members are intoxicated or sober. Thus, the extent of integration of the factors that operate in different realms and levels (social, economic, cultural) influences the occurrence of aggression during intoxication.

2. *Social Structural Patterns and Social Correlates.* Much of the research on the social sources of substance use and aggression has examined the joint occurrence of substance use and criminality. Over fifty years of research on the relation between substance use and violence

has yielded contradictory and ambiguous findings (Austin and Lettieri 1976; Elliott and Ageton 1976; Gandossy et al. 1980; Inciardi 1981; Clayton and Tuchfield 1982; Watters, Reinerman, and Fagan 1985; Collins 1986; Johnson et al. 1986*b*). Although there is little doubt that individuals who drink or use drugs are more likely to commit crimes than those who avoid substance use, there is conflicting evidence on the strength or direction of the association. Recent evidence suggests that there may be "common causes" or a "third factor" that explains the joint behaviors or suggests whether the same factors may be equally efficient at explaining them independently (Elliott, Huizinga, and Ageton 1985; White, Pandina, and LaGrange 1987). Among delinquents, the probability of more frequent and severe¹⁷ drug use increases with the severity and frequency of delinquent involvement (see Chaiken and Chaiken, in this volume, and Hunt, in this volume, for reviews of research on drug-crime relationships).

The age and gender distribution of criminal violence seems also to describe the intoxication-aggression relation. Violence while intoxicated is the province of young males (Gandossy et al. 1980). Analysis of national survey data (Cahalan and Cisin 1976; Blane and Hewitt 1977) shows that drinking patterns of younger males tend to be characterized by binge drinking, often associated with aggressive behavior. These studies found the highest rates of violence and verbal aggression following drinking among twenty-one to twenty-four-year-old respondents. Wechsler (1979) surveyed college undergraduates in the New England states and found nearly ten times the rate of aggression while drinking for males. Among adolescents, Jessor and Jessor (1973, 1977) found more deviant behavior (especially assaultive behavior) among students who drink than among nondrinkers. However, Jessor and Jessor report also that youths who are aggressive while drinking also are aggressive while sober, suggesting a spurious relation between alcohol use and aggression among adolescents.

In inner-city areas, where the social correlates of both substance use and crime are concentrated, violent youths were more likely to be involved in frequent alcohol and drug use, though the majority of alcohol and drug users were involved infrequently in violent behaviors (Fagan et al. 1987). White, Pandina, and LaGrange (1987) analyzed longitudinal data from a representative sample of New Jersey adoles-

¹⁷ Use of drugs other than alcohol or marijuana, specifically hallucinogens, opiates, cocaine, barbiturates, amphetamines, or PCP.

cents and found that few respondents reported concurrent involvement in "serious" alcohol use, drug use, or delinquency.¹⁸ Elliott, Huizinga, and Ageton (1985) analyzed a national probability sample of adolescents and also found that alcohol and substance abuse were highest for "multiple index offenders," but the explanatory variables of substance use overlapped with those for delinquency.

Chaiken and Chaiken (in this volume) summarize empirical research on substance use and "predatory" crimes and find that predatory offenders commit violent crimes at a high rate and are also likely to be frequent users of several drug types and alcohol. They are also likely to have irregular employment and weak family (marital) ties. However, the Chaikens are quick to point out that addiction or pathological intoxication often are not associated with violence. Moreover, changes over time in individuals' substance-use patterns are not a function of their participation in criminal activity. However, Ball et al. (1982) and Speckart and Anglin (1986) show that heroin addicts commit far more crimes during periods of addiction than during periods of abstinence or withdrawal.

Some of these empirical trends may result from the design artifacts of the studies that characterize this literature. There seems to be more empirical evidence available about adolescents in general population samples, often in longitudinal studies. In contrast, few cross-sectional or longitudinal studies are available about the substance use and illegal behaviors of adults. Rather, empirical evidence on adults is based often on either clinical samples (substance users or offenders in treatment) or on criminal justice populations. There are few efforts, other than national surveys on alcohol and (rarely) on drug use, that include responses from general adult populations. Accordingly, both epidemiological knowledge and assessments of risk factors and etiological variables are concentrated on adolescent behaviors.

Despite controversy over the direction and strength of the drug-crime relation, the consistent association between them suggests that there are correlates of the joint behaviors as well as potential discriminators of the individual or joint behaviors. In general, the correlates of criminality generally mirror the correlates of substance use. Both literatures agree on age, sex, and ethnic relations, as well as on a variety of social factors including family relations and peer groups. For both race and class relations, the relation to delinquency and drug use is

¹⁸ Their definition of "serious" use was three or more occasions in the past year of each behavior.

ambiguous other than for the more serious delinquent activities (Weiner and Wolfgang 1985) or persistent drug use behaviors (Johnston, O'Malley, and Bachman 1985). The incidence of delinquency and the drug-delinquency correlation are higher among males than females, especially for harder drugs (Johnson et al. 1986b), and among minority youths (Elliott and Huizinga 1983; Newcomb and Bentler 1988).

Numerous studies have identified common social correlates of delinquency and drug use, including family structure and process, school performance and experience, religious ties and commitments, and a variety of psychological, interpersonal, and attitudinal variables (see Huba and Bentler 1984; Kaplan, Martin, and Johnson 1986; and Newcomb and Bentler 1988, for thorough analyses of these literatures). Other studies have examined risk factors across time periods. For example, Kandel et al. (1986) analyzed risk factors for both delinquency and drug use in the transitional years from adolescence to young adulthood. They found that transitions into conventional roles of adulthood, such as continuous employment and marriage, in the period *subsequent* to adolescence predicted future drug use but not delinquent involvement.

However, peer associations have been the most consistent and strongest correlates of both delinquency and drug use. Specifically, the behavior of close friends appears to be most strongly associated with both avoidance and participation in deviant behaviors, including initiation, development of approving attitudes, social reinforcement, and progression from experimental or occasional use to more serious and sustained behaviors (Jessor and Jessor 1977; Kandel, Kessler, and Margulies 1978; Akers et al. 1979; Kandel 1980, 1985, 1986; Elliott, Huizinga, and Ageton 1985; Giordano, Cernkovich, and Pugh 1985; Kaplan, Smith, and Robins 1986; Fagan et al. 1987; White, Pandina, and LaGrange 1987). Jessor and Jessor (1977) suggest that qualitatively different behaviors may serve similar purposes (e.g., expressions of independence from parental control). Schwendinger and Schwendinger (1985) suggest that peer networks form according to similar processes and exert similar social influences on their members with respect to delinquency but remain separate and distinct. There indeed may be synchronous group processes in separate networks but with similar influences, which would explain the parallel contributions to dissimilar behaviors within deviance-specific groupings.

Thus, it is not clear if there is one deviant subculture or many. If there were one generally deviant subculture, it would be hard to conceptualize why a group or individual chose a particular behavior to the

exclusion of the others. For crossover or joint behaviors, the network may simply be one that supports both behaviors, with similar processes (and correlates) in delinquent networks that eschew drug use but whose behavioral norms develop independently. But if there are separate (but perhaps parallel) subcultures, the similarities and differences between these groups are as yet little understood. Yet they are critically important in explaining variation among similar groups within cultures.

3. *Violence and Substance Use in Specific Social Contexts.* Research on social processes and causes of the intoxication-aggression relation has focused on specific social contexts. Studies of barroom brawls typify this approach (Gottlieb 1957). In contrast, the Burns (1980) and Zinberg (1984) studies illustrate the interaction between social set and setting that determines when intoxication can contribute to aggression, and when context mitigates violence while intoxicated. Youth gangs and family violence, two well-studied areas, are discussed below; these are realms in which the intoxication-aggression relation is well established but where violence also occurs often in the absence of intoxication. These perspectives illustrate the theories of cultural defense and social determinism that explain a significant portion of the intoxication-aggression relation.

a) *Youth Gangs.* In this decade, gang violence increasingly has been linked to drug use and drug dealing (Klein 1985; Mieczkowski 1986; Fagan 1989). The relation between drug use and serious youth crime is consistently strong under a variety of sampling and measurement conditions. However, gangs are diverse, complex, and shifting organizations whose members participate variably in crime and drug use (Stump-hauer, Veloz, and Aiken 1981; Hagedorn 1988; Klein and Maxson 1989; Spergel 1990). Accordingly, the social organization of substance use and its influence on aggression is likely to vary.

Recent evidence suggests that gang members may also have greater involvement in drug distribution than do other adolescent youths, increasingly for "hard" drugs, leading to what Goldstein (1989) terms "systemic violence" involving drugs. Analyses of gang and nongang homicides (Maxson, Gordon, and Klein 1985), and gang involvement in rock cocaine trafficking (Klein, Maxson, and Cunningham 1988), suggest that Los Angeles gangs increasingly are involved in drug selling. Mieczkowski (1986) reported on adolescent heroin sellers in Detroit, while Cooper (1987) described Detroit youth gangs organized around crack cocaine distribution. Each study reported that gang members used violence both to maintain organizational discipline and for market

regulation and control. In several Chicago neighborhoods, gangs control drug sales to juveniles (Rechtenwald and Sheppard 1984; Spergel 1984). Dolan and Finney (1984), among many, clearly show the economic lure of drug sales for gang members, relative to other economic opportunities. Klein (1985) suggests that the sudden emergence of "rock" or "crack" cocaine provided unique economic opportunities which Los Angeles gangs quickly took advantage of.

Drug use among gang members has been noted consistently in gang research. However, until recently, there has been little distinction made regarding patterns of drug use among gangs and the relation between drug use, gang cohesion, and gang activities. Stumphauzer, Veloz, and Aiken (1981) noted that patterns of drug use varied within and among Los Angeles gangs. Campbell (1984) and Dolan and Finney (1984) illustrated the commonplace role of drug use in gang life among both males and females. Vigil (1985, 1988) described a variety of meanings and roles of drug use among Chicano gang members in East Los Angeles, from social "lubricant" during times of collective relaxation to facilitator for observance of ritual behaviors such as *locura* acts of aggression or violence. In these contexts, drug use provided a means of social status and acceptance as well as mutual reinforcement, and was a natural social process of gang life.¹⁹

Feldman, Mandel, and Fields (1985) observed three distinct "styles" among Latino gangs and street-corner groups in San Francisco that in part were determined by the role and meaning of drug use in their social processes. The "fighting" style included males in gangs who were antagonistic toward males in other gangs. They aggressively responded to any perceived move into their turf by other groups or by any outsider. Drug use and selling were evident but were only situationally related to their violence through territoriality. Violence occurred in many contexts unrelated to drug use or selling and was an important part of the social process of gang or group affiliation. The "entrepreneurial" style consisted of youths who were concerned with attaining social status by means of money and the things money can buy. They were very often active in small-scale illegal sales of marijuana, pill amphetamines, and PCP. While fighting and violence were part of this

¹⁹ Vigil notes that these patterns are confined to substances that enhance gang social processes—alcohol, marijuana, PCP, and crack cocaine. There is a sanction against heroin use among Chicano gangs. Heroin involvement is seen as a betrayal of the gang and the barrio: one cannot be loyal to his addiction and the addict ("tecató") culture while maintaining loyalty to the gang.

style, it was again situationally motivated by concerns over money or drugs. The last style was evident in gangs whose activities were social and recreational, with little or no evidence of fighting or violence.

Drug use also is disallowed in some youth gangs, regardless of the gang's involvement in drug selling. Chin (1986) found that drug use was rejected entirely by Chinese gangs in New York City, despite their involvement in heroin distribution. They used violence to protect their business territories from encroachment by other gangs and to coerce their victims to participate in the gang's ventures. These gangs were hierarchically organized with strict codes and violent consequences for rule violations by members. Cooper (1987) described organizations of adolescent crack sellers in Detroit who prohibited drug use among their members. Leaders in these groups were wary of threats to efficiency and security if street-level sellers were high and to the potential for co-optation of its business goals if one of its members became involved with consumption of their goods. The gangs were organized around income and saw drug use as detracting from the selling skills and productivity of its members. Expulsion from the gang resulted from breaking this rule, but other violent reprisals also were possible.

Mieczkowski (1986) studied adolescent heroin runners (street dealers) in heroin-dealing organizations, also in Detroit, and found a rejection of heroin use by members of the runner organization. However, these gangs accepted recreational use of other drugs by members, primarily marijuana and cocaine, in social situations not involved with dealing. They particularly found danger in being high on any drug while on the job, and superiors in the gang enforced the prohibition against heroin use while working by denying runners their consignment and, accordingly, shutting off their source of income. Violence was occasionally used by superiors (crew bosses) to enforce discipline. Gang members looked down on their heroin-using customers, despite having tried it at some point in their lives, which in part explains the general ideology of disapproval of heroin use.

The discovery of diverse patterns of criminality and drug involvement among gang members and gangs suggests that there are factors in the social organization of gangs and processes of affiliation and cohesion that either encourage or discourage these patterns (Fagan 1989; Spergel 1990). Such diversity also exists among general adolescent populations (Schwendinger and Schwendinger 1985; Fagan, Weis, and Cheng 1990) and suggests that gangs reflect patterns of affiliation and collective behavior similar to other adolescent subcultures. Accordingly, violence

and drug involvement, which historically have been taken as defining features of gangs, may be more accurately conceptualized as contingent behaviors that vary by factors that have not been given adequate theoretical or empirical attention.

b) *Family Violence.* There is widespread belief that intoxication, particularly drunkenness, is a major cause of wife beating and child abuse. Historical analyses by Pleck (1987) trace these beliefs in American society to the colonial era. A Gallup poll, cited by Coleman and Straus (1983), found that almost one in four respondents believed alcohol to be the cause of family violence. Winick (1983) described how popular culture portrayed the effects of drinking on wife beating: in Tennessee Williams's *A Streetcar Named Desire*, a drunken Stanley Kowalski strikes his pregnant wife Stella, and later on strikes his sister-in-law Blanche DuBois (herself a former alcoholic) on the night that Stella delivers their first baby. Similar episodes occurred in Edward Albee's *Who's Afraid of Virginia Woolf*, when George and Martha drink through the night and become increasingly abusive to each other, though only verbally.²⁰ In *The Brothers Karamazov*, Dostoevski hints (but does not directly assert) that alcohol may have led Dmitri to kill his father. In the 1980s, the musical satirist Kinky Friedman penned the darkly humorous song, "I'd Kill My Mother for Another Line of Cocaine." Kantor and Straus (1987) point out that these images not only link drug use and aggression, but also directly attribute stranger and family violence to intoxication and portray it as an underclass phenomenon.

The empirical evidence on the contribution of intoxication to aggression in families is equivocal. Wolfgang (1958) coined the phrase "victim-precipitated homicides" based on the incidence of intoxication of homicide victims, including victims of domestic homicides. Bard and Zacker (1974), studying a broader range of domestic violence cases, found only a weak association between alcohol and family violence. Kantor and Straus (1987) reviewed fifteen empirical studies on alcohol and spouse assault and found a wide range of reports of the presence of alcohol—from 6 to 85 percent. Fagan, Hansen, and Stewart (1983) reported that the severity of spouse abuse was positively associated with alcohol use by the assailant, but there was a weak, negative association with use of other substances. Coleman and Straus (1983) suggest

²⁰ Martha then went on to have sexual relations with their young male dinner guest, illustrating the image of alcohol as a disinhibitor of sexual behaviors as well as of aggression.

that although reports of alcohol use are high among spouse abusers, the rates are no higher than among the general population. Bard and Zacker (1974) conclude that the relation between spouse abuse and alcohol use was spurious. Establishing a precise relation is made difficult by variation in measures of spouse assault, alcohol or drug use (frequency, severity of intoxication, and impairment), and the variety of sampling and research designs. Thus, for example, Kantor and Straus (1987) reviewed clinical samples of spouse abuse victims (in shelters) or abusers (in batterer treatment) and found higher incidences of alcohol use among spouse abusers than in general population studies or police samples.

Mayer and Black (1981) reviewed the limited evidence on intoxication in cases of child abuse and found a similar broad range of reports of the presence of alcohol problems—from 32 to 65 percent—in families where a child had been abused. However, Steele and Pollack (1968) found no incidence of alcoholism among sixty families where child abuse had occurred. Such discrepancies may result from design and measurement problems that are typical of empirical research on child and spouse abuse.

Hotaling and Sugarman (1986) used a different research strategy to address the question of the intoxication-aggression relation for husband-to-wife violence. They analyzed case-control studies of spouse and child abuse, concentrating on the strength of effects of variables across studies that met minimal design criteria. Alcohol was one of the variables that met their criteria of a positive, significant association in two-thirds of the studies in their analysis which established it as a risk factor for husband-to-wife violence. Abuse of other substances was not found to be a significant risk factor that was positively correlated with spouse assault. Rather, they found an equal number of studies that indicated either positive or negative associations of spouse abuse with other substances. Accordingly, alcohol appears to be a significant correlate of wife abuse, but not child abuse, while drug use is associated with neither form of intrafamily violence.

Two studies examined the incidence of alcohol use in a nationally representative population of families. Coleman and Straus (1983) analyzed data from a 1975 nationwide survey of a representative sample of 2,143 American couples (married and cohabiting) who were interviewed on the frequency of violence between partners in the relationship and the frequency of intoxication from alcohol. The results showed a positive association between the frequency of alcohol con-

sumption and violence between cohabitants. Rates of violence were nearly fifteen times greater for husbands who were drunk "often" compared to "never" during the past year.²¹

In the second study, Kantor and Straus (1987) analyzed data from telephone interviews conducted in 1983 with a nationally representative sample of 5,159 households.²² Unlike the Coleman and Straus (1983) study, this study asked if there was drinking at the time of a violent incident. In 76 percent of the households where violence occurred, alcohol was *not* used immediately prior to the incident. However, controlling for respondents' *usual* drinking patterns, there was a positive association between the percent who were violent and who were drinking immediately prior to the violent incident. Among "binge" drinkers, nearly half (48.4 percent) were drinking prior to a violent episode, compared to fewer than one in five (19.4 percent) for "infrequent" drinkers. The authors caution that over 80 percent of all respondents in the highest frequency drinking categories did not assault their female partners *at all* in the past year, and nearly two-thirds of blue-collar workers were nonviolent during the study year.

Star (1980) characterized persons violent toward family members as needing power and control and likened violent spouses to alcohol users in such characteristics as extreme jealousy, external blame, sexual dysfunction, and bizarre mood shifts. Speiker (1983) found that both spouse abusers and their victims tended to blame alcohol for the violence, and that men used it as an excuse for their violence. Coleman and Straus (1983) draw on deviance disavowal theories to explain behaviors among people who do not view themselves (or their behaviors) as deviant but need some excuse (such as alcohol) for their unacceptable behavior. By "explaining" violence toward spouses as the result of intoxication, their social standing and self-image are preserved. The behavior is deviant, but not the individual. Intoxication provides a "time out" for such deviance to occur.

Similar to processes described by MacAndrew and Edgerton (1969)

²¹ However, for men who were the most frequent alcohol users (i.e., those who were "almost always" drunk), violence rates were half those of the "often" drunk respondents. The survey did not inquire about the co-occurrence of intoxication and spouse abuse—whether violence occurred while either of the partners was intoxicated. The authors conclude that the heaviest drinkers are "anesthetized," both emotionally and physiologically.

²² Eligible households included an adult female (over eighteen years of age) who was either married, recently divorced or separated (within the past two years), not married but cohabiting with a male as a "couple," or a single parent with a minor (less than eighteen years of age) child in the household.

in their cross-cultural studies, the norms for conventional and appropriate behavior were set aside temporarily. However, the process of redefinition uses some external factor (e.g., intoxicants), rather than a conscious decision to behave outside acceptable boundaries. Coleman and Straus (1983) suggest that these processes actually could promote the behavior by offering an advance excuse for their acts. This is similar to the behaviors of gang members and others whose use of substances is designed to create the circumstances when violence can occur.

Both the Kantor and Straus (1987) and Coleman and Straus (1983) studies also suggest that expectancy develops via social learning processes. They conclude that persons learn reactions to alcohol and behaviors while intoxicated through observations in the family context. Other theories also would apply, if we accept the claims of Star (1980) and Speiker (1983) that violence in the family is an expression of power and control. Power-motivation theory (McClelland and Davis 1972; McClelland 1975) suggests that drinking and violence may be a means of asserting power and control in the family. However, other studies of family violence (Dobash and Dobash 1979; Bowker 1983) conclude that the maintenance of masculine power and control is a motivation for domestic violence, independent of external factors.

The findings regarding alcohol and the Bowker (1983) and Dobash and Dobash (1979) studies agree that socioeconomic status also is important and interacts with intoxication to increase the severity of violence.²³ Bowker (1983) found that the men most violent toward spouses were working-class men who were most deeply embedded in "male subcultures," as measured by time spent in bars with male comrades. However, the intoxication-family aggression relation is present even when there is disapproval of violence, for example, among middle-class men. Accordingly, it is likely that, for middle-class men, processes of deviance disavowal and "time out" may permit the assault of spouses. For working-class men, expectancy of behaviors during intoxication, reinforced by both social learning experiences and societal approval for the use of force within families to assert and maintain supremacy, contributes to violence during intoxication. Kantor and Straus (1987) suggest that both processes operate among working-class men.

²³ This does not deny the distribution of family violence across social classes. See Straus, Gelles, and Steinmetz (1980), and Straus and Gelles (1986).

Thus the interaction of personality, social network, situation or setting, and cultural norms provides a powerful influence on individual behaviors in the family while intoxicated (and among strangers, as illustrated by Burns's study of the Charlestown youths). Though most violence occurs in the absence of alcohol or other intoxication, there appear to be parallel etiological processes leading to the onset of family violence, and substance abuse contributes to the continuation of aggression over a "battering career."

II. Explanatory Models of Intoxication and Aggression

The association between intoxication and aggression has been noted by researchers for centuries. However, despite a vast literature spanning several disciplines, there is little empirical evidence within or across disciplines to support the separate explanations of the precise causal mechanisms by which the measurable effects of intoxication may lead to specific aggressive behaviors. There is no empirical evidence for attribution of a *causal* relation of intoxication to aggressive behavior—regardless of the type of substance—on the basis of strong correlations. The most influential evidence shows that one's belief that he or she is intoxicated (especially from drinking) affects behavior in much the same way as the actual consumption of a substance. Although experiments offer reliable evidence that aggression increases during intoxication, that evidence cannot account for the results of cross-cultural studies, the high base rates of intoxication without aggressive behaviors, and the mediating effects of social setting and expectancy. Moreover, the empirical literature also contains far more information about alcohol than other substances, and there have been extremely few studies that compare the effects of different substances within controlled settings or similar experimental frameworks. Watters, Reinerman, and Fagan (1985) examined the literature on both alcohol and other intoxicants and concluded that situational and conditional factors still make causal connections difficult to demonstrate. Wolfgang's (1981) conclusions, though referring to alcohol, apply equally to the broader knowledge base on all intoxicants: "The presence of alcohol may be a *contributing* factor, may be positively *correlated*, may be a determinant, but our scholars are unwilling to assert *cause*. And rightly so, for the best available evidence is sometimes contradictory and never fully compelling and convincing. Alcohol may arouse aggression or may augment aggressive behavior which may, in turn, result in criminal assault. But

many other things also promote aggression, and even aggression aroused need not lead to criminal behavior" (Wolfgang 1981, p. ix, emphasis in original).

The influence of intoxication on aggression is a complex phenomenon, and explanations that draw narrowly from within disciplines are likely to have weak explanatory power. For example, theories that might explain the interaction of substance and expectancy should incorporate pharmacological, physiological, social-psychological, cultural, and emotional (or cognitive) factors. Understanding the intoxication-aggression relation may require several explanatory frameworks.²⁴ However, few theorists have developed explanations or models that integrate factors from several disciplines into a unified theoretical framework that specifies causal mechanisms and mediating processes.

This section reviews three theoretical frameworks that integrate explanations and empirical evidence from different disciplines and sources of effects. Collins (1983) and Reinerman and Critchlow-Leigh (1987) fault previous theories for failing to specify the precise mechanisms that explain how intoxication can cause aggression under certain conditions. The frameworks reviewed in this section meet this criterion in that they attempt to integrate empirical evidence and theoretical perspectives from several disciplines.

A. *Power-Motivation and Developmental Explanations*

Young adult males are involved disproportionately in violent behavior resulting from problem drinking (Cahalan and Room 1974; Jessor and Jessor 1977; Collins 1983; Levinson 1983*b*) or drug use (Elliott and Huizinga 1984; Wish and Johnson 1986; Fagan et al. 1987). There also is a general association of young males with violent behavior (Weiner and Wolfgang 1985). Collins (1981) concludes that the social-

²⁴ Writing specifically about alcohol, but again with broader implications for the intoxication-aggression relation, Pernanen (1976, 1981) suggests that several frameworks may be necessary to explain the empirical correlations between consumption of intoxicants and interpersonal aggression. Fagan et al. (1987), writing specifically about adolescent violence and drug use, also suggest that different explanatory models are necessary given the diversity of observed patterns. Pernanen suggests a typology of causal models, similar to the typologies discussed in earlier sections of this essay. First, the *common* cause theory assumes that the factors that cause aggression and violence are similar to the factors that cause extreme forms of intoxication, especially alcoholism or addiction. Second, he posits a *conditional* relation, where the intoxication-aggression relation is mediated by the social context in which substances are used, the nature of an individual's personality, or socialization that determines one's expectations for behaviors while intoxicated. Third, a *spurious* model suggests that there simply is a correlation without theoretical meaning.

psychological dynamics of the transition from adolescence to adulthood are particularly important to understanding the intoxication-aggression relation. He suggests that theories that account for the social status of youths, as well as their transitional developmental stages, are necessary to explain the frequent joint occurrence of aggression and substance use.

Power-motivation theories were developed by McClelland and colleagues (McClelland and Davis 1972; McClelland et al. 1972; McClelland 1975) to explain motivations for drinking. His theory that people drink in response to a desire for personal dominance offers a potential link to the relation between alcohol use and violence. The basic premise is that drinking enhances personal power, particularly the power to gain victories in confrontations with personal adversaries. The theory is specific to males and has been applied by Kantor and Straus (1987) to examine the alcohol-family violence relation. The perspective suggests that violence can occur during drinking episodes when an intoxicated male may resort to violence to win in a conflict situation.

Transitional developmental periods also are periods when problem behaviors are evident (Jessor and Jessor 1977; Kandel, Simcha-Fagan, and Davies 1986). Kandel, Simcha-Fagan, and Davies (1986) found that the drug use-crime relation was strongest for twenty-four-year-old males when they encountered problems entering the "traditional" roles of worker and marital partner during their transitions from adolescence. Jessor and Jessor (1977) also suggest that problems in life cycle transitions are accompanied by problem behaviors, resulting from changes in expected social roles and behaviors. Fagan et al. (1987) found that among adolescents, the presence of such problems had strong explanatory power in distinguishing controlled drug use from problem drug use and drug use that occurred jointly with violent crimes. These periods also seem to be marked by what Collins (1983) refers to as "hypermasculinity."

There seems to be a close relation between male sex role socialization and aggressive behaviors while intoxicated during the uncertain periods of transition from adolescence to adulthood (McClelland and Davis 1972). Kantor and Straus (1987) suggest an interaction between power-control theories, male sex role socialization, and the co-occurrence of drunkenness and family violence. Young men are at particularly high risk for domestic violence (Hotelling and Sugarman 1986). Violence in the home often manifests a compulsive need to maintain power and control (Bowker 1983, 1986*b*; Walker 1984), especially against the

threat of loss of dominance or control (Dobash and Dobash 1979). Bowker (1983) suggests that the deeper males are embedded in social systems that reinforce their domination and control in the home, the more likely they are to use force to maintain control. Not coincidentally, bars are locales where such socialization often occurs, according to Bowker, as well as to Shields, Hannecke, and McCall (1989).²⁵

Thus for family violence there may be several cognitive connections to alcohol: social cue, socialization process, and behavioral expectancy for violence. Similar interpretations may be applied to the use of substances within youth gangs, where intoxication provides both the social “glue” that causes the gang to cohere as well as the “fuel” for the inevitable intergang conflicts that maintain gang boundaries and social relations (Vigil 1988). Burns (1980) also demonstrated the motivation of power-control drives in *specific settings* during the socially complex night of drinking of the Charlestown youths.

The convergence of factors related to the intoxication-aggression association for young males in several settings suggests that young adulthood is a period when there is an exaggerated dependence on socially expected behaviors, in which the social context of substance use conveys several meanings—the enhancement of personal power that is not yet available through “traditional” social roles and the maintenance of power through force. Also, the limited social and personality development of young males in early adulthood may create dependency on external norms for determining expected and appropriate behaviors. Accordingly, the integration of power-motivation theories with perspectives on moral (e.g., Kohlberg 1973) and social (e.g., Jessor and Jessor 1977) development, as well as explanations of violence toward intimates, provides potentially fertile ground for understanding the causal role of intoxication in aggression.

B. Pathology, Cognitive Functioning, and Disinhibition

Physiological and pharmacological explanations of the intoxication-aggression relation share the perspective that ingestion of drugs or

²⁵ The socialization that may occur in that setting can set expectations among males for control over their spouses or female cohabitants, and also legitimate the use of force to maintain it, in a milieu that links violent behaviors to the social cues of drinking. Such contexts provide the frames of reference and cues with which drinkers may make sense of the social interactions. Reinerman and Critchlow-Leigh (1987) refer to alcohol in this context as communicating specific social meanings within a culture. This is similar to what Heath (1983) discusses as the importance of *semiotics* to interpret the meanings of words and actions.

alcohol leads to changes in physiological or psychological functioning that, in a sober state, restrain behavior. The pathological framework states that a pathological condition in the individual can lead to aggression following substance use, either alone or in combination with other factors. Intoxication also may result in cognitive impairment that alters the processing of information or interpretation of social cues, leading to contingencies that produce aggressive responses. A third class of explanations attributes a direct pharmacological or psychoactive effect to substances, though failing to specify neurological or other linkages between substance, brain function, and behavior. This is the classic disinhibition hypothesis.

1. *Pathology and Psychological Impairment.* One simple explanation of the aggression-intoxication relation is the underlying pathology of the individual who uses substances excessively. The American Psychiatric Association acknowledges a disorder characterized by a "marked behavioral change—usually to aggression—that is due to the recent ingestion of an amount of alcohol that is insufficient to produce intoxication in most people" (American Psychiatric Association 1987, p. 128). Other conceptualizations suggest that underlying pathologies are activated by the ingestion of substances (Kramer 1983; Mayfield 1983), leading to states of anxiety, hostility, or paranoia. These conceptualizations leave open the etiological roots of the pathology, though none suggests that substances directly cause personality disorder. At least one study (Ylikahri et al. 1978) claims that alcohol may stimulate the production of cortisol, an arousal or stress hormone that has been linked to aggression. An alternate view is that prolonged substance abuse can itself produce pathologies or emotional states that may lead to aggression (Wilson and Abrams 1977).

2. *Cognitive Impairment.* There is substantial evidence that various substances may impair cognitive functioning (see Pernanen 1976 and 1981, regarding alcohol; and Woody et al. 1983, regarding several types of drugs). Pernanen (1981) developed a model in which intoxication has a disorganizing effect on cognitive functions, especially the ability to process the cues of communication, and causes a general narrowing of the perceptual field. In turn, this may lead to a random determination of behavior, rather than to the contingent behaviors that result from accurate perceptions of social cues. Accordingly, an interpretation of another person's behavior as arbitrary can lead to aggressive behavior. Also, intoxication may reduce an individual's ability to use various coping devices in situations seen as arbitrary or threatening (Collins

1983). However, the effects of intoxication on behavior are not uniform and tend to vary by individual personality factors and emotional or affective states (Holcomb and Adams 1985). These emotional states are also subject to interpretations that are filtered through cultural beliefs, circumstances, and personality, factors that are not easily explained at the individual level (Room 1983).

3. *The Disinhibition Hypothesis.* Until recently, the disinhibition hypothesis has been prominent in explanations of behavioral changes during intoxication. Its basic underlying premise is that intoxication alters central nervous system or psychological functions that are thought to control or inhibit aggression. Once intoxicated, individuals were free of moral or cognitive restraints on behavior. Competing explanations within this framework suggested that substances either accelerated processes that contributed to behavior, or loosened the moral or learned restraints against behavior. It has been most prominently applied in explanations of the alcohol-violence relation (see Collins 1983, for a critical review) and sexual behaviors (see Reinerman and Critchlow-Leigh 1987, for a critical review) and sexual aggression (Langevin et al. 1988).

However, the inadequacy of these three perspectives is readily demonstrated. For example, pathological intoxication is characterized by nonaggressive states more often than violent behavior. In common lore, the "maudlin," "amorous," and "gregarious" drunks all typify behaviors that were not manifest before but that emerge following alcohol intoxication (Mayfield 1983). The "giggles" and "munchies" are states often produced by marijuana intoxication (Zinberg and Jacobson 1976). But there is virtually no evidence of aggression resulting from the pharmacological effects of marijuana.

The phenomenon of controlled drug use also contradicts the concept of an inevitable relation between drug abuse and aggression, even during periods of frequent opiate use (cf. Ball et al. 1982; Johnson et al. 1985). Waldorf (1973) described the controlled heroin use of the majority of addicts, while Waldorf (1983) and Biernacki (1986) reported on desistance from opiate use by long-term addicts without treatment. Waldorf, Reinerman, and Murphy (1990) studied over 200 high-rate cocaine users (over two grams per week for at least six months) who reported acute changes in their personalities but avoided interpersonal aggression. Woods and Mansfield (1983) reviewed physiological research on disinhibition and concluded that there are no explanations for the effects of substances that span the course from ingestion of ethanol to neuron transmission to central nervous system functions. Simply,

there is too much unknown about the processes that might link *behavior* and *substance* to conclude that there exists such a process as "disinhibition." Research on expectancy, summarized earlier in this essay, further disputes the notion of pharmacologically-induced changes in affective states. The effects of expectancy on interpretation of social cues in competition paradigms further mitigates explanations regarding the specific physiological effects of intoxicants on cognitive or emotional states that do mediate aggression.²⁶

Research on intoxication and aggression often has overlooked the distinction between acute and chronic intoxication and their differential effects on affective or personality states. Collins (1988) specifically analyzes this distinction for alcohol: acute effects include short-term physiological, cognitive, and mood alterations following ingestion of a substance. Chronic effects, including personality deterioration and physical disabilities, take place over longer periods of prolonged use. He suggests that acute drinking effects may be more important to the occurrence of aggression. Analyses of similar phenomena for heroin use (Zinberg 1984), cocaine inhalation (Erickson et al. 1987; Waldorf, Reinerman, and Murphy 1990), cocaine smoking (Siegel 1982*a*, 1982*b*), and marijuana use (Zinberg and Jacobson 1976) do make this distinction but fail to find differences in effects on the intoxication-aggression relation.

Collins (1989) cites several studies that link problem drinking to a multiple-disorder configuration in which individuals with alcohol disorders frequently have other personality disorders such as crippling anxiety or sudden changes in affective states (Harwood et al. 1985; Stinson and Williams 1986). Accordingly, the etiology of compulsive intoxication also may be etiologically relevant to other types of personality or psychiatric disorders that, in turn, mediate aggression. Whether aggression follows intoxication depends in part on the psychological processes that either precede substance use or are intensified following ingestion.

C. Culture and Context: Situational and Sociocultural Factors

There is a growing consensus that the effects of culture, setting, and expectancy shape behavioral responses to intoxication. The ethnographic work of MacAndrew and Edgerton (1969), discussed earlier,

²⁶ Only Steele and Southwick (1985) have found a measurable "alcohol effect" apart from cognitive expectancy, in the relation between alcohol and aggression. However, the preponderance of evidence continues to suggest that expectancy, socially learned, is the strongest argument to dispute disinhibition effects.

found that attitudes toward drinking and rules that govern behavior after drinking are variable across cultures, within the same culture at different times, and even within subcultural networks of the same culture. Comparative analyses of ethnographic research on drug use among adolescents revealed similar diversity in the behaviors that accompanied its use (Feldman, Agar, and Beschner 1979; Feldman, Mandel, and Fields 1985). Accordingly, understanding the origins of expectancy and social controls regarding drinking requires an examination of the factors within cultures that shape beliefs about the effects of substances, the history of social meanings assigned to intoxication from various substances, the social controls that permit or sanction behaviors while intoxicated, and the communication of those rules across diverse circumstances.

1. *Situational Factors.* Substance use and behavioral norms vary both by culture and the specific social setting within the culture. For example, there is a cultural tendency to ascribe blame to alcohol for most of the negative behaviors that occur following its consumption. This “malevolence assumption” (Hamilton and Collins 1981) suggests a moral status of alcohol. The same has developed over time regarding most illicit drugs (Musto 1981), despite empirical evidence that their ill effects are not felt by the majority of users. There can be little doubt that these attributes of most substances influence their cultural phenomenology and, in turn, expectancies of their effects on behaviors. However, analyses of expectancy (e.g., Critchlow-Leigh 1986) suggest that beliefs about expected behavioral effects of substances vary according to the social situations where intoxication occurs.

Social situational factors are attributes of an immediate setting that directly or indirectly influence the behavior of intoxicated people in that setting. Both Burns (1980) and Levinson (1983a) cite three situational factors that influence the social processes of a setting: the number of people present, the nature of their relationships (intimate, familial, adversarial), and the permissiveness of the situation. Interpersonal violence seems to occur in some situations more than others and even in different venues of the same type of setting. For example, there is more violence in some bars than others, though there also is more violence in bars than in other social contexts where alcohol is used. Aggression occurs in some sports stadiums and more often during some types of sporting events than others. The absence of informal social controls, external restraints, or perceptions of societal approval may contribute to interpersonal aggression between intimates following intoxication (Straus 1978).

Permissiveness describes the social controls of the setting that sanction or accept behaviors. The origins of these norms or permitted behaviors is uncertain, but some research suggests how controls against aggression during drug or alcohol use are maintained. For example, the peer processes within the groups described by Reinerman (1979) for cocaine and Zinberg (1984) for heroin suggest a strict social setting that does not tolerate behaviors not approved by the group's norms. And among adolescents, the use of certain intoxicants (e.g., PCP or alcohol) that produce exaggerated, boisterous behaviors can result in ostracism from a cohesive social group (Feldman, Mandel, and Fields 1985).

Roman (1981) defined a "situational ecology" that either constrains or permits specific behaviors. An ecology of aggression might include the nature of the relationships among those in the setting and the type of environment (private home, tavern, open space, public event). Steadman (1982) suggests that we study "violence prone situations," defined as the interaction between specific types of people and situations.²⁷ Levinson (1983a), Roman (1981), and Steadman (1982) include in this ecology factors that exist at different levels and may interact to produce aggression: social setting at the small group or situational level and cultural processes at the societal or subcultural level. In this ecology, aggression during intoxication may convey several meanings or purposes: interpersonal or intergroup conflict, ritual or social adjunct, or expression of power and control. Understanding the dimensions of an ecology of behavior during intoxication may contribute to explanations of the social sources of aggression during drug or alcohol use.

2. *Deviance Disavowal.* Beliefs about the effects of specific substances have fostered the "excuse function" of substances and "relaxed standards of accountability" under the influence of substances (Collins 1988). Similar patterns are noted within subcultures regarding other substances—although within the United States, the meanings and norms of substance use differ widely across adolescent subcultures (Beschner and Friedman 1986). Heath (1978) suggests that there are special beliefs in nearly all cultures regarding alcohol, but the rules for drunken comportment are contradictory across cultures. It is likely, then, that the "excuse" function of intoxicants also has largely cultural determinants.

²⁷ Steadman found that violence in interpersonal disputes was greatest when the dispute was outside the home, late at night, when alcohol or drugs were used by either party involved, in the presence of third parties, where strangers were involved, and where one party was physically dominant over the other.

This notion of the disavowal of deviance essentially relocates blame for behavior from the individual to the substance. Reinerman and Critchlow-Leigh (1987) suggest that this not only serves to excuse misbehavior while intoxicated but it also reassures others that the behaviors themselves do not challenge the legitimacy of the violated norms. Thus wife beaters do not challenge the sanctity of marriage or the societal laws against assault. The use of rationalization or externalization of blame has been used to explain other forms of deviance and criminality. Sykes and Matza (1957) suggested that the denial of responsibility was one of several “techniques of neutralization” that individuals use to justify criminal behavior. Disavowal also permits behaviors that violate nonlegal social taboos, especially sexual behaviors or revelry (MacAndrew and Edgerton 1969; Reinerman and Critchlow-Leigh 1987).

The plausibility of the disavowal framework depends on the acceptance of these accounts of behavior by society. Such accounts help avoid the assignment of an identity to an individual consistent with their deviant behavior (e.g., Scott and Lyman 1968).²⁸ Collins (1983) suggests that there is a synergistic relation between cultural acceptance of such accounts and the relocation of blame to substances that are widely thought to “cause” or at least excuse such behaviors. When cultural evaluations accept the view that substances cause aggressive or illegal behavior, then these accounts are more often honored by society, and the use of such excuses also is greater. However, acceptance of “excuses” is mutable and is vulnerable to historical and cultural shifts in societal attitudes about substances (see Silver 1979, regarding marijuana; Reinerman 1979, regarding cocaine; Musto 1981, regarding opiates; and Reinerman 1988, regarding Mothers against Drunk Driving and the modern temperance movements).

3. *Interactions between Culture and Behavior.* Collins (1989) suggests that expectancy also has cultural roots—beliefs and expectations about the psychopharmacological effects of a substance that help shape the rules governing its use and the behavioral effects anticipated after ingestion. Understanding controlled drug use tells us much about the cultural and social factors that shape expectancy toward aggressive or nonaggressive behaviors. In turn, these may influence changes in cognitive, affective, or emotional states following intoxication.

²⁸ Legitimate accounts, for example, are those that rely on widely shared underlying assumptions, and that are understood by the situationally relevant group as applying to it.

Zinberg (1984) analyzed interviews with 153 controlled opiate users.²⁹ He identified four controlling rituals and social sanctions that promote controlled use within subcultures of drug users: (1) rules and boundaries that defined moderate and compulsive use; (2) norms that limited use to physical and social settings that were conducive to positive or "safe" drug experiences; (3) explicit recognition of potentially harmful or unpleasant drug effects; and (4) rituals that supported users' non-drug-related relationships and obligations (e.g., family, work, money). These rituals developed within social networks of drug users and were communicated primarily through peer group processes (Zinberg 1984). Others have noted similar, parallel group processes within independent networks of drug users (Reinarman 1979; Schwendinger and Schwendinger 1985; White, Pandina, and LaGrange 1987). The social learning basis for these peer group processes is evident in the description by Zinberg (1984, p. 18): "Without doubt the most important source of precepts and practices for control is the peer using group. Virtually all of our subjects had been assisted by other non-compulsive users in constructing appropriate rituals and sanctions out of the folklore of and practices circulating in their drug-using subculture. The peer group provided instruction in and reinforced proper use; and despite the popular image of peer pressure as a corrupting force pushing weak individuals toward drug misuse, our interviews showed that many segments of the drug subculture have taken a firm stand against drug abuse."

The cultural phenomenology of different substances apparently has varying interpretations not only in different cultures (Heath 1983) but also for specific social groups within cultures. Explanations of the effects of intoxication on aggression must account for the development, maintenance, and expression of such normative processes within social groups regarding the uses of substances and the permitted behaviors following their use.

Such cultural processes themselves are mutable. Hamid (1989) studied the evolution of illicit substance use and trafficking over a ten-year period in several New York City neighborhoods with high concen-

²⁹ Controlled use was defined as consistent drug use without experiencing the potential harms of each substance. Multiple and daily use were excluded as frequency categories. The initial frequency criterion for subject selection was one use per week or less for at least one year prior to interview. Subjects had first used an opiate at least two years ago and in the past two years had had as many days of abstinence as use. Moreover, they were required to have not used any substance in an uncontrolled way, using the same criterion of abstinence days.

trations of Caribbean immigrants. In these neighborhoods, substance users and dealers are primarily types of laboring populations with a specific social organization that is closely tied to the economic functions of their community and are responsive to their social and economic developmental processes. As neighborhoods change in their commercial and social makeup, so, too, do patterns of substance use and the social controls on aggression that define behaviors (following drug use) that are permitted.

As new drugs entered the study neighborhoods (from marijuana in the 1960s and 1970s, to opiates in the 1970s, and then to cocaine and crack in the 1980s), profound changes occurred in the intoxication-aggression patterns among the residents. Hamid's ethnographic research found that the forms of social organization and social rituals of drug use were established, then dismantled and reconstituted in novel ways when use of one substance was succeeded by use of another. As new networks of distribution developed, so, too, did new forms of social control. Specifically, marijuana dealers recycled funds in their areas, leaving intact the major forms of informal and formal social control. But cocaine and crack dealers removed money and goods from circulation, changing the social organization of drug use and weakening the formal and informal social controls. Accordingly, the intoxication-violence relation strengthened in this decade in the areas studied by Hamid (1989). He concludes that a political-economic analysis is necessary to understand the social controls on substance use and violence, apart from systemic violence associated with dealing. Not only do the cultural phenomenology of a substance and the immediate social network of the user influence expectancy but also the norms within these networks may develop and change in response to social and economic influences on the users' social milieu.

III. An Integrated Perspective on Aggression following Intoxication

The deficiencies of these separate perspectives result not from the individual weaknesses of each explanation but from dependence on any one framework as a unicausal theory to explain the variation in the intoxication-aggression relation. Each has some validity but offers only a partial explanation for the empirical knowledge on aggressive behavior following intoxication. No single framework can be expected to explain what obviously is an extremely complex relation between substance use and aggression. Nor can any framework explain the variation in why people

use substances. It is more likely that the separate frameworks offer complementary explanations, and each perspective adds a unique contribution to the development of more complex models of the effects of substances on behavior.

A. An Integrated Model of Substance Use and Aggression

The evidence from several disciplines suggests that individual attributes, both psychological and physiological, combine with cognitive and emotional factors that are interpreted through social-psychological contexts and situational factors to explain the interaction between substance and individual, set, culture, and behavior. There is little explanatory power to the intoxication-aggression association when the partial correlations of culture and social interaction are removed. Moreover, these processes vary by type of substance. Social networks and their subcultural *milieux* determine the social construction of substance-use patterns and shape the cognitive and emotional processes that transform the effects of substances from physiological response to aggressive behavior.

Evidence from the studies of alcohol on both sexuality (Wilson and Lawson 1976; Reinerman and Critchlow-Leigh 1987) and interpersonal aggression (Steadman 1982; Collins 1983, 1988), as well as on drug use and interpersonal behaviors (Steadman 1982; Zinberg 1984; Feldman, Mandel, and Fields 1985), converges in one critical area: intoxication affects cognitive processes that shape and interpret perceptions of both one's own physiology (i.e., expectancy) and the associated behavioral response. The cognitive processes themselves are influenced by cultural and situational factors that determine the norms, beliefs, and sanctions regarding behaviors following intoxication.

In developing a general model of the influence of alcohol on aggression, Collins (1983) suggests two major independent variables that increase the probability of violence during social interactions following alcohol use: psychological proclivity toward the exercise of personal power in an overt manner and beliefs that alcohol causes aggression. Each of these factors in turn influences cognitive processes that interpret both the situation and the appropriate behavioral response. One effect of alcohol on cognitive processes is a reduction in behavioral repertoire, and the use of violence results either from personal proclivity or cultural beliefs, forces that further proscribe responses to social interactions during drinking situations.

The sources of aggression in this stochastic model operate mainly at

the individual level. Propensity toward aggression reflects explanations regarding the use of personal power to resolve perceived conflicts. This concept resembles Megargee's (1983) concept of "habit strength" in his "algebra of aggression," but it also includes basic intrinsic motivations for violence. It also is similar to the "set" in Zinberg's (1984) theory of behavior as the result of interactions between set (personality), setting, and substance. Cultural beliefs are expressed through the individual who believes, as does the society, that intoxication (especially drunkenness) induces aggression. Culture, therefore, has both direct effects (through expectancy) and indirect effects through its influence on mediating cognitive processes. Moreover, cultural beliefs are likely to produce "accounts" that allow him or her to shift blame to alcohol and therefore perceive fewer social rules against aggressive behaviors.

The empirical evidence with respect to both drugs and alcohol suggests that individual behaviors vary by set and setting; that is, the same individual consuming the same substance will behave differently in different situations. For example, gang members use alcohol in two distinctly different contexts: to embolden members for aggression in one setting and to make the group socially cohesive in another (Moore 1978; Vigil 1988). Beliefs about behaviors that are permissible, and the effects of specific substances, accordingly are determined by processes that are social and vary by situation. Drug- or alcohol-use behaviors themselves vary by social setting and are shaped by the norms and rituals of the setting. These may include social norms that either promote or impede aggression. Also, cognition interacts with social cues to produce an interpretation of the setting where drinking or drug use takes place, while personality variables also affect the cues (and their interpretation) that trigger cognitive reactions. This suggests three processes that are needed to explain aggression following intoxication: first, the probability of exposure to a situation that is associated with aggression; second, the probability that an individual will react aggressively when exposed to the same contextual stimuli; and third, the probability that the factors favoring an aggressive response outweigh the restraints or sanctions against it.

In sum, rather than being a linear process, aggression following intoxication is more likely to be a reciprocal process in which expectancies and physiological factors, social norms, events in specific situations where substances are used, and cultural factors have multiple and recursive interactions leading to aggressive or nonaggressive behaviors when intoxicated. That is, situational variables and group processes

(conveyed through social-learning processes) are likely to affect variations in the behaviors that follow intoxication; these relations then will alter the individual's selection of contexts and his or her social construction or cognitive interpretation of these contexts and will affect the probability of aggressive behaviors in subsequent encounters. The influence of larger political, economic, and social organizational influences on culture and social controls on drug use and aggression also must be acknowledged.

Emerging from this perspective is an integrated model presented in figure 2. The psychoactive properties of various substances, their availability, and individual physiological and psychological factors are exogenous factors that influence other social-psychological processes. An example of an individual personality factor is the propensity to use violence to resolve interpersonal conflicts or the habit strength of violence that has been socially reinforced through past experiences during stages of social and personality development. Cultural factors include beliefs about permitted behaviors for each substance and the meaning of substances in various cultural processes and subcultural groups (ceremonies, spiritual or religious uses, social interaction). These factors in part determine the settings where substances are used and influence individual choices about when and where to use them. The settings and social contexts also influence the choice of substance, convey the rules and norms proscribing behaviors, the cognitive interpretation of the situation, and, accordingly, the probability of aggression in that situation.

The interaction between personality and social context to produce controlled or uncontrolled substance use and manage aggression is critical to this model. Individuals form perceptions of their environments and internalize the expected responses to social situations through the development of personality. Social-learning processes affect these internal perceptions and the capacity to activate internal controls. Experiences with intoxicants, both psychoactive and social experiences, socialize users not only to the effects of the substance but also to the expected social behaviors that accompany that state. Zinberg (1984) suggests that people select explanatory constructs from a range of cognitive and emotional perceptions available to them, and their responses would follow the available explanations of their situation. The boundaries of those responses are determined by three factors: perceptions of the expected environment, personality variables such as relative ego autonomy, and responses to the substance itself. These three processes

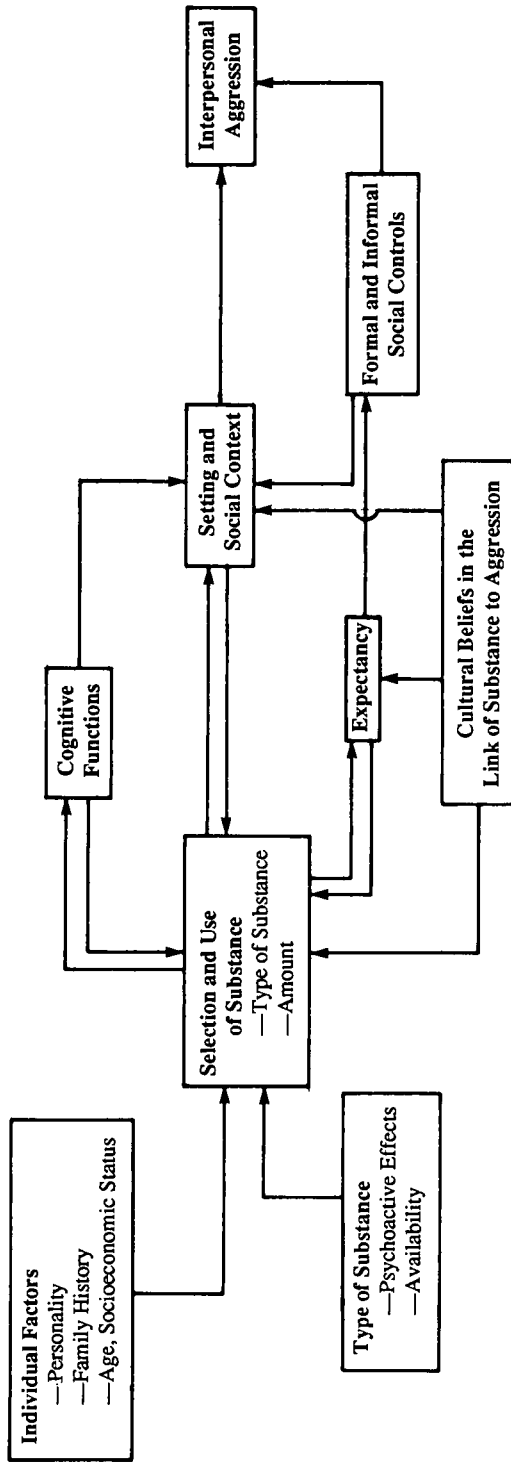


FIG. 2.—An integrated theoretical model of processes explaining aggression following intoxication

are influenced strongly by social-learning processes. Social-learning processes teach users about the expected behaviors in various social settings, determine perceptions of the psychoactive effects of the substance itself,³⁰ and also influence personality factors by raising apprehensions about danger or moral ambiguity. The delicate interplay of these factors responds to the social cues of the setting where substances are used and reciprocally may determine the selection of setting where people go to use substances. From these cues, aggression may follow logically from the controls that are internally activated and the social controls present in the setting.

However, unlike a linear model, these relations also have “backward” effects on the same social processes. For example, an individual who is apt to exhibit aggressive behaviors in bars is unlikely to select bars where aggression is negatively sanctioned. Or an individual may choose to use substances he or she can manage effectively to remain in a social context that has some utilitarian value or emotional attachment. At the social and cultural levels, weak social organization may permit or promote certain specific forms of intoxicated behaviors at the group or neighborhood level. Thus patterns of aggression following intoxication develop over time through socialization within specific social contexts and the shaping of behaviors through social-learning processes. Individuals may initially have diverse experiences with settings and substances but ultimately are likely to gravitate toward social contexts that offer a match between personal proclivities (base rates of aggression, beliefs in the legitimacy of violence, use of accounts based on cultural interpretations of intoxication) and the social rituals of that scene. However, such personal proclivities also may include a desire for acceptance in nonviolent social worlds, and, accordingly, selective processes of affiliation may ensue depending on the type of social gratification sought.

B. Implications for Research and Policy

This model is a first step in articulating reciprocal processes that operate at multiple levels to explain sociocultural-cultural processes underlying the intoxication-aggression relation. Similar models have been developed to explain the etiology of delinquent conduct, combining individual and socialization processes (Thornberry 1987). Such

³⁰ See Becker (1967) for a description of how social-learning processes were influential in determining responses to LSD.

models require extensive development to describe and define their constructs in a way that permits study in diverse settings. One task for future research is to learn the forms of these interactions and the processes by which factors at one level of influence are linked to processes at another level. Thus the origins of controlled use and the social processes that support that use are as critical to understand as are the methods by which groups enforce and communicate those norms. These questions will be answered through multimethod and multilevel analyses involving experiments in different social contexts with different substances, surveys in different cultures and social groups, aggregate data analysis of consumption and behavioral patterns, and ethnographic reports to unravel multilevel causal sequences and reciprocal effects.

APPENDIX

Psychoanalytic Theory of Addiction (From Pihl [1983], p. 307)

Addiction Is

Substitute for sexual pleasure
 A fixation at the oral stage
 And/or the anal stage
 And/or the phallic stage

Irrespective of Stage, Addicted Individuals Show

A polymorphous-perverse need for love
 Repressed but sometimes blatant homosexuality
 Mild neuroticism hiding anger and low self-esteem
 A counterphobic tendency
 Expression of unmet dependency needs
 Ambivalent feelings toward parents
 Self-destructive drives
 Hysteria
 Obsessive-compulsive neuroses
 Sexual disorder
 Suicide
 Psychoses

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