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Sexual Addiction & Compulsivity

ISSN: 1072-0162 (Print) 1532-5318 (Online) Journal homepage: http://www.tandfonline.com/loi/usac20

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To cite this article: Steve Sussman (2005) The Relations of Cigarette Smoking with Risky Sexual Behavior among Teens, Sexual Addiction & Compulsivity, 12:2-3, 181-199, DOI: 10.1080/10720160500203732

To link to this article: https://doi.org/10.1080/10720160500203732

Sexual Addiction & Compulsivity, 12:181–199, 2005

ISSN: 1072-0162 print / 1532-5318 online
DOI: 10.1080/10720160500203732

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The Relations of Cigarette Smoking with Risky Sexual Behavior among Teens

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This paper discusses the co-occurrence of cigarette smoking and sexual behavior among teens. Empirical support for their co-occurrence, eight reasons why they may co-occur, and negative emotional and physical consequences of their co-occurrence is discussed. In addition, prevention implications for teens are suggested.

Cigarette smoking often has been associated with sexual allure. Symbolic uses of the cigarette to suggest sexual behavior, the ritual of smoking a cigarette after termination of a sexual episode, the concept that cigarette smoking makes one more attractive physically (e.g., more thin), or more available (more willing), have permeated Western society for many years (e.g., Brown & Witherspoon, 2002). There are many examples in which smoking and sexuality have been intertwined. A mass media example, the recent teen-movie "Saved!" with Mandy Moore (2004; United Artists) is rated PG-13 for strong thematic issues involving teens, sexual content, pregnancy, smoking, and language. As another example, sexuality of smoking has been a social image perpetrated by the tobacco industry in advertisements (e.g., often employing attractive celebrities), and in the use of cigarette tray sales girls (e.g., Honjo & Siegel, 2003; Missouri Association of Local Public Health Agencies [MoALPHA], 2004; U.S. Department of Health and Human Services [DHHS], 1994).

However, one probably should not assume that the two behaviors are semantically connected merely because of mass media or advertisement ploys. Anecdotally, smoking behavior-related terms that appear on web pages or in conversations such as "French inhale," "hand-free drags," "cheek hollows" (while smoking), and "puckered lips" do suggest

This research was supported by grants from the National Institute on Drug Abuse (DA1384, DA016090) DA07601, DA13814, and DA16094.

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intrinsically sexual connotations of smoking (e.g., see www.celebsmoking.com; www.rootdogg.com). Further, when one lights up another's cigarette, the two people become close physically during that act (e.g., lips to hand that lights the cigarette). This physical intimacy, which can occur among near-strangers, could be interpreted in sexual terms by some people. The blowing of smoke out of one's body into another's may be interpreted as sexual for some people. Smoking does exert a direct effect on one's metabolic rate to speed it up, and can lead to some reduction in weight (Klesges, Klesges, & Meyers, 1991). Even a little reduction in weight may appeal to images of being thin and hence more sexually attractive (U.S. DHHS, 1994). Certainly, smoking is a cue among young persons that they are risk takers, and might be more willing to take risks in their sexual behavior as well (U.S. DHHS, 1994). Thus, through social learning processes, as symbolic acts, through physiological processes, or as expressions of risk-taking, among other processes as described later in this paper, one can envision several functional relations among cigarette smoking and sexual behavior.

Before outlining the content of this paper, it should be mentioned that these two behaviors are differentially viewed as risky or problematic as a function of age and context. Among any age and in any context, cigarette smoking may be viewed as unhealthy and problematic for self and others (U.S. DHHS, 1994). Sexual behavior, on the other hand, is viewed as a healthy and normal behavior for certain age groups and in certain contexts (Williams & Knight, 1994). For the purposes of reproduction and planned, controlled mutual pleasure among consenting adults, sexual practice is not injurious (barring differential religious and moral beliefs that may define its consequences). However, compulsive sexual behavior (implying a loss of control), unsafe sexual behavior (e.g., without use of STD prevention methods), or potentially illegal sexual behavior (e.g., sex for money, the appropriateness of which varies by culture) is considered unhealthy and destructive to self and others among all age groups (Williams & Knight, 1994).

The appropriateness of sexual behavior is subject to more divergent views regarding teens. Many investigators define any sexual relations as unhealthy or dangerous among teens (e.g., Hallfors et al., 2004; Stuart-Smith, 1996). Thus, there is empirical work presented in this paper that defines "risky" sexual behavior among teens as having any sex—also referred to as "early sex." Early sex can refer more specifically to such behaviors as petting (Maruyama, Nishi, & Yamashita, 1991; Willoughby, Chalmers, & Busseri, 2004), or sexual intercourse (e.g., Alexander et al., 1989; Blum et al., 2000; Busen, Modeland, & Kouzekanani, 2001; Donnelly et al., 2001; Ekeus & Christensson, 2003; Everett et al., 2000; Farrell, Danish, & Howard, 1992; Flisher et al., 1996; Hallfors et al., 2004; Kinsman et al., 1998; Kraft, 1991; Lam, Stewart, & Ho, 2001; Maruyama, Nishi, & Yamashita, 1991; Parillo, Felts, & Mikow-Porto, 1997; Paul et al., 2000; Pederson & Stavraky, 1987; Poulin & Graham, 2001; Robinson, Telljohann, & Price, 1999; Rosenbaum & Kandel,

1990; Springarn & DuRant, 1996; Turbin, Jessor, & Costa, 2000; Willoughby, Chalmers, & Busseri, 2004).

A few of these investigators (i.e., Everett et al., 2000; Lam, Stewart, & Ho, 2001; Poulin & Graham, 2001; Springarn & DuRant, 1996) and many others also recognize sexual behavior among teens as reflecting historically normative behavior (Lerman, 2000), and define "risky" sexual behavior among teens (particularly among older or high-risk teens) as including such hazardous activities as having multiple sexual partners, not using condoms consistently, or using alcohol during sex (e.g., Bardone et al., 1998; Basen-Engquist, Edmundson, & Parcel, 1996; Biglan et al., 1990; Brown & Witherspoon, 2002; Duncan, Strycker, & Duncan, 1999; DuRant, Krowchuk, & Sinal, 1998; Escobedo, Reddy, & DuRant, 1997; Everett et al., 2000; Howard & Wang, 2004; Lam, Stewart, & Ho, 2001; MacKenzie et al., 1998; Matos et al., 2004; Poulin & Graham, 2001; Robbins & Bryan, 2004; Shrier et al., 1997; Springarn & DuRant, 1996; Valois et al., 1999). Both early sexual behavior and hazardous sexual behavior perspectives are assessed with the Youth Risk Behavior Survey (National Center for Chronic Disease Prevention and Health Promotion; http://apps.nccd.cdc.gov/yrbss), which was used or adapted in several of the studies cited in this paper (DuRant, Krowchuk, & Sinal, 1998; Everett et al., 2000; Howard & Wang, 2004; Shrier et al., 1997; Springarn & DuRant, 1996; Valois et al., 1999).

The present paper provides a systematic examination of the relationship of cigarette smoking with sexual behavior among teens (i.e., persons 12–19 years of age). First, empirical associations between these behaviors are presented. Next, the reasons that these two behaviors might overlap are discussed. Eight reasons are presented. These include: addictive-like qualities, dopamine neurotransmission, behavioral disinhibition, socioeconomic culture, role modeling, problem behavior, substitute addictions among persons in recovery, and fetish-type reasons. Then, the negative emotional and physical consequences of the associations of the two behaviors are discussed. Finally, prevention program implications are presented briefly.

ASSOCIATIONS OF CIGARETTE SMOKING WITH TEEN SEXUAL BEHAVIOR

An increasing pool of studies has shown an association between cigarette smoking and sexual behavior within the U.S. and elsewhere. An exhaustive search of OVID, MedINFO, and PsycINFO abstracts from 1980 to December 2004, using the cue words pairings of "smoking" and "sexual behavior," "tobacco" and "sexual behavior," "teen smoking" and "sexual behavior," "teen tobacco use" and "sexual behavior," "adolescent smoking" and "sexual behavior," and "adolescent tobacco use" and "sexual behavior" revealed a total of 29 empirical studies that examined covariation among the two behaviors among teens.

A total of 19 of these studies were completed in the U.S. Cigarette smoking and having sex as a teen were found to be positively associated among a nationally representative sample of white male and female teens, and Hispanic female teens (Escobedo, Reddy, & DuRant, 1997), among a nationally representative sample of female teens (not Hispanic or African American male teens, and marginally among African American Females in the expected direction; Howard & Wang, 2004), and among a nationally representative sample of older teens (Everett et al., 2000). In addition, smoking and teen sex were found to be positively associated among a primarily African American sample of teens from a large southeastern city ($rxy = .43$; Farrell, Danish, & Howard, 1992). In another study in the same southeastern city these results did not hold for African American males (Parillo, Felts, & Mikow-Porto, 1997). Positive relations were found among young teens at another southeastern city (Robinson, Telljohann, & Price, 1999) and among older white and African American female teens in a Statewide South Carolina survey (but not African American males; Valois et al., 1999). This same positive relation was found among a heterogeneous sample of teens in a large urban Rocky Mountain region ($rxy = .35$; Turbin, Jessor, & Costa, 2000), among teens in the same Rocky Mountain region seen at STD or teen clinics (at least a third were frequent smokers, MacKenzie et al., 1998), among Oregon, rural, white teens (Biglan et al., 1990; Duncan, Strycker, & Duncan, 1999), among those teens that completed a statewide survey in Texas (Basen-Engquist, Edmundson, & Parcel, 1996), and among a small heterogenous sample of teens at a large Texas public health clinic (Busen, Modeland, & Kouzekanani, 2001).

Further, a positive relation among teen sexual behavior and smoking was found among a large sample of Vermont teen males who have sex with teen males (DuRant, Krowchuk, & Sinal, 1998), among a large random sample of older Massachusetts teens (Shrier et al., 1997), among a large sample of New York city teens (Rosenbaum & Kandel, 1990), only slightly, among young urban youth in Philadelphia (24% versus 18% had tried a cigarette during 6th grade among sexual intercourse initiators vs. non-initiators; Kinsman et al., 1998), among young, urban teens in New Jersey (Donnelly et al., 2001), and among white Maryland female teens (not males; Alexander et al., 1989).

To summarize, in three nationally representative samples, four southeastern region samples, six western region samples, and six northeastern region samples, the two behaviors were found to be positively associated across gender and ethnicity. In these 19 studies, 9 used the early sexual behavior perspective, whereas 10 studies used the hazardous sexual behavior perspective. All three national studies used the hazardous sexual behavior perspective. In the southeast, west, and northeast regions of the country, three, two, and four studies used the early sexual behavior perspective, respectively, and one, four, and two studies used the hazardous sexual behavior perspective, respectively. The same pattern of relations of sexual behavior with cigarette smoking held regardless of sexual behavior perspective. The only exceptions in these relations were found as a function of gender and

ethnicity and pertained to four studies that included poor Hispanic or African American males (Alexander et al., 1989; Escobedo, Reddy, & DuRant, 1997; Parillo, Felts, Mikow-Porto, 1997; Valois et al., 1999), which may reflect differential socioeconomic cultures as discussed later in this paper.

Outside of the U.S., teen participation in sexual behavior was found to be associated with cigarette smoking in several Canadian provinces (Pederson & Stavraky, 1987; Poulin & Graham, 2001; Willoughby, Chalmers, & Busseri, 2004), among female teens and adults in Argentina (Matos et al., 2004), among teens in the Stockholm, Sweden area (Ekeus & Christensson, 2003), among older teens in Norway (Kraft, 1991), among female teens in New Zealand (only a weak relation among males, in the expected direction; Paul et al., 2000), among older teens and emerging adults in Hong Kong (Lam, Stewart, & Ho, 2001), among female junior college attendees in Japan (Maruyama, Nishi, & Yamashita, 1991), and among male teens in South Africa (not females; Flisher et al., 1996).

Thus, in ten other studies, four in the Americas, two in Northern Europe, and four in the Far East or Africa, the same positive association between cigarette smoking and sexual behavior was revealed. Seven of these studies used the early sexual behavior perspective, and three used the hazardous sexual behavior perspective. (Two of these three latter studies used both perspectives; i.e., Poulin & Graham, 2001; Lam, Stewart, & Ho, 2001. Only Matos et al., 2004 took only a hazardous sexual behavior perspective.) The Flisher et al. (1996) study is the only one of 29 studies to fail to find a relation between cigarette smoking and sexual behavior among female teens, perhaps due to a low incidence of smoking among women in South Africa (Marks, Steyn, & Ratheb, 2001). More international empirical work is needed.

The fact that a positive association between cigarette smoking and sexual behavior among teens was found in 29 studies conducted over at least a 25-year period indicates that this is real phenomenon worthy of continued exploration. However, the reasons for this association are largely unexplored. Several possible explanations exist, as presented in the next section.

REASONS THAT SMOKING AND SEX MIGHT OVERLAP

At least eight plausible reasons exist that might explain why smoking and sexual behavior are closely related. The reasons presented are not intended to be a mutually exclusive or exhaustive list. Rather, they delineate a wide breadth of explanations, including both intrapersonal and extrapersonal factors, which could stimulate future research (Sussman & Ames, 2001).

Cigarette Smoking and Sexual Behavior: Substance and Process Addictions

Arguably, both cigarette smoking and sexual behavior among teens are endowed with seductive, addictive qualities that may eventuate into

self-destructive patterns of behavior over months or years. Schaef (1987) proposed a typology to attempt to differentially classify various addictive behaviors. Substance addictions involve all mood-altering products, including drugs (e.g., caffeine, nicotine, alcohol, cocaine, heroin, etc.) and food-related disorders (e.g., anorexia, bulimia, overeating, etc.). Cigarette smoking is an example of a substance addiction. Through ingestion of a substance, an individual may attempt to achieve a desired or expected state. Substance addictions involve direct manipulation of pleasure through use of products that are taken into the body. By intake of these products, perhaps a direct effect on neurotransmitter systems associated with pleasure occurs. Repeated use of a substance may lead to a variety of consequences.

Process addictions (Schaef, 1987) consist of a series of actions that expose one to "mood-altering events" on which one becomes dependent (e.g., gambling, workaholism, excessive exercise and sex, excessive spending, excessive television watching, and so on). Compulsive sexual behavior is a process addiction. Through repetitive sexual behavior, an individual may attempt to achieve a desired state, similar to that desired by a substance addiction. Process addictions involve a more indirect manipulation of pleasure though situational and physical activity manipulations, which may then alter neurotransmitter function (Bradley & Meisel, 2001; Mani, Mitchell, & O'Malley, 2000; Sussman & Ames, 2001).

The *DSM-IV-TR* (APA, 2000) provides diagnoses for nicotine dependence and withdrawal. However, it does not provide a category for nicotine as a substance abuse disorder. In the future, nicotine use may even become defined as a category of substance abuse disorder (i.e., as legal violations in public areas become enforced, as physical hazards of smoking such as fires are increasingly recognized, as work and social roles become compromised in an environment that increasingly recognizes the dangers of passive smoke, and as its use becomes more disapproved of by society).

The *DSM-IV-TR* also provides diagnoses for sexual disorders and dysfunctions (APA, 2000). However, debate continues regarding the notion of sexual addiction (Carnes, 1996). Yet, there may be commonalities between sexual addiction and other addictions (including cigarette smoking-related addiction). These include obsessions, loss of control, compulsive behavior, continuation despite adverse consequences, escalation of behaviors, and high relapse rates after treatment (Sussman & Ames, 2001). In addition, many tobacco and other drug abusers report being addicted to sex (Schneider, 1994). Indeed 12-Step, recovery organizations exist for both use of tobacco (e.g., Smokers Anonymous) and compulsive sex (e.g., Sex Addicts Anonymous). Increasingly, compulsive sexual behavior is viewed as an addiction (hence, the creation of journals such as *Sexual Addiction & Compulsivity: The Journal of Treatment and Prevention*; Seegers, 2003).

Cigarette Smoking, Sexual Behavior, and Dopamine

Both cigarette smoking and sexual behavior may alter mesolimbic dopaminergic transmission. Dopamine is the neurotransmitter thought to underlie novelty-related pleasure and facilitate dependence on a drug or behavior (Sussman & Ames, 2001). Cigarette smoking ultimately affects dopamine D2 receptor neurotransmission (Lerman et al., 1999). Cigarette smoking activates dopamine neurons in the nucleus accumbens. Sexual behavior also can activate dopamine neurons in the nucleus accumbens and can cross-sensitize neuronal responses to drug intake (of amphetamine, Bradley & Meisel, 2001; possibly of THC, Mani, Mitchell, & O'Malley, 2000). Also, dopamine release can stimulate sexual behavior (Wersinger & Rissman, 2000). Thus, both behaviors are related to dopamine release and, therefore, may serve similar functions in terms of pleasure and novelty experience. The effect of substances and behaviors on dopamine release is not independent of their potential roles as addictions, as dopamine is the primary neurotransmitter implicated in the addictions (Sussman & Ames, 2001).

Behavioral Disinhibition

Both cigarette smoking and sexual behavior among teens may be a function of behavioral disinhibition. That is, both behaviors may reflect impulsive, sensation seeking teen behavioral preferences (Ary et al., 1999; Robbins & Bryan, 2004). There are three possible ways in which disinhibition may operate on the association between smoking and sexual behavior. First, smoking may disinhibit one's behavior, facilitating sexual behavior. That is, the relationship between smoking or other drug use and (risky) sexual behavior could be conceptualized as a result of the disinhibiting effects of drugs consumed and subsequent diminished decision making and judgment (e.g., Leigh & Schafer, 1993; Peugh & Belenko, 2001). A deficit in serotonergic neurotransmission has been linked to impulsive behavior. It is possible that nicotine may increase dopamine function while simultaneously decreasing serotonin function (Hollander & Rosen, 2000; Olausson, Engel, & Soderpalm, 2002). If so, smoking might lead to increases in impulsive behaviors, which could include sexual behavior.

Second, engaging in sexual behavior may, conversely, result in a subsequent tendency to reach for a cigarette without much thought (Sussman & Ames, 2001). For example, adolescents who visit STD clinics are twice as likely to be smokers as teens who visit general community health centers (MacKenzie et al., 1998). Through an implicit cognitive associational network, sexual behavior may automatically cue smoking as an alternative source of subjective relaxation (Sussman & Ames, 2001). Interestingly, in one study among teens in the Seattle area, experimenters in cigarette smoking who did not escalate in their smoking, were more likely to use condoms consistently than smokers who did escalate their smoking (Guo et al., 2002). Thus, one

may speculate that restraint in one behavior is associated with restraint in another.

Third, regardless of the impact of smoking on sexual behavior or the converse, teens may be prone to engage in either behavior as a function of general disinhibition (e.g., Robbins & Bryan, 2004). Among teens, cognitive immaturity, reflected by incomplete myelination of the frontal lobe of the brain and incomplete connections between the limbic system and the neocortex until later in adolescence, may lead to impulsive, immediately pleasurable activities that are removed from more foresight or planning (Stuart-Smith, 1996).

Thus far, explanations of the relations among smoking and sexual behavior include addiction, effects on dopamine, and disinhibition effects. These explanations are physiologically-based, or intrapersonal in content (Sussman & Ames, 2001). Other possible explanations fall into the realm of one's social environment (Sussman & Ames, 2001).

Socioeconomic Cultures

Both cigarette smoking and age of first intercourse are inversely related to parents' income among teens, and are positively related to living in a single-parent home, other drug use, subsequent pregnancies (Albrecht & Caruthers, 2002; Blum et al., 2000; Eckert, 1983; Kinsman et al., 1998), and early marriages (Martino, Collins, & Ellickson, 2004). One may conjecture that cigarette smoking and sexual behavior reflect lower socioeconomic status teens' early entry into adult-like roles. These teens may need to take on employment to support the family, forgoing educational opportunities. Smoking may be a means of bonding among such youth (e.g., Eckert, 1983). Subsequent to family creation, these youth may begin smoking to help cope with the additional stresses incurred (e.g., Blum et al., 2000).

While many pregnancies are unplanned (Martino, Collins, & Ellickson, 2004; Spingarn & DuRant, 1996), sexual behavior may be participated in for the purposes of family creation among some teens. For example, among poor African Americans sexual behavior may signify a transition to adulthood in a world in which upward mobility is doubted, and as part of agrarian Southern culture (Blum et al., 2000).

However, there may be some sociocultural variations in the pattern of relations of smoking with sexual behavior. Lower socioeconomic status African Americans are relatively likely to engage in sexual intercourse at a young age but not smoke until they are older teenagers (Blum et al., 2000). Conversely, lower socioeconomic status whites are relatively likely to smoke at a young age (Blum et al., 2000), but engage in sexual intercourse at a somewhat older age. One may speculate that poor whites perceive greater upward mobility and that smoking and sexual behavior are relatively more related to risk-taking among them and relatively less a reflection of entry into adult roles

(e.g., Sussman et al., 2003). More research is needed on the effects of ethnicity and socioeconomic status as moderators of the relation between cigarette smoking and sexual behavior among teens.

Role Modeling

Teens also may engage in smoking and sexual behavior due to observing such behaviors among their family or peers, or in the media. For example, Wilder and Watt (2002) reported from the National Longitudinal Study of Adolescent Health (in which data were collected in the home from both teens and parents) that teens whose parents engaged in risky behaviors (smoking, drinking, and seat belt nonuse) were relatively likely to smoke cigarettes, be sexually active, and report having had sex before 15 years of age. Teens may directly model parents' behavior, explore new behaviors as the result of parents' tolerance of deviant behavior, take risks as a reaction to high levels of family conflict, or may learn symbolic relations from parents (e.g., smoking cigarettes and engaging in sex are what adults do; e.g., Ary et al., 1999; Blum et al., 2000; Paul et al., 2000; Sussman & Ames, 2001; Wilder & Watt, 2002). One other study by teens' self-reports-only suggested minimal parental influence on smoking or sexual behavior (Beal, Ausiello, & Perrin, 2001). Additional research is needed.

Several studies indicate that peer-modeling or direct peer social influence may lead to engagement in smoking and sexual behavior (Ary et al., 1999; Beal, Ausiello, & Perrin, 2001; Kinsman et al., 1998; Wilder & Watt, 2002). Association with deviant peers is relatively likely to lead a teen to adopt the values of the group and participate in common behaviors that may include smoking and sexual behavior (Ary et al., 1999; Wilder & Watt, 2002). Finally, one comprehensive review suggested that the mass media depicts smoking and sexual behavior as glamorous and risk-free and may influence teen behavior through social modeling effects (Brown & Witherspoon, 2002).

Both intrapersonal factors (e.g., addiction proneness, neurotransmission, and behavioral disinhibition) and extrapersonal factors (e.g., socioeconomic status and role modeling) may explain the co-occurrence of cigarette smoking and sexual behavior among teens. These myriad of factors may operate together to determine a variety of co-occurring lifestyle-related behaviors. These behaviors often are referred to as "problem behaviors" because they place youth at risk for negative consequences and transgress social norms of appropriate teen behavior (Sussman & Ames, 2001; Turbin, Jessor, & Costa, 2000).

Cigarette Smoking and Sexual Behavior as Problem Behaviors

There is evidence that cigarette smoking and sexual behavior among teens do not occur as a solitary manifestation of an individual's behavior, but that they often are facets of a cluster of behaviors and attitudes that form a lifestyle

(Eisenman, Dantzker, & Ellis, 2004; Hovarth, 1999; Newcomb & McGee, 1991; Turbin, Jessor, & Costa, 2000). These behaviors include cigarette smoking, other drug use, drug abuse, child sexual abuse, child sexual experimentation, prevalence of sexually transmitted diseases, prostitution, truancy, violence perpetration, and illegal behavior such as stealing (e.g., DuRant, Krowchuk, & Sinal, 1998; Schwartz et al., 1999; Spingarm & DuRant, 1996; Sussman & Ames, 2001). In other words smoking and sexual behavior co-occur with several other risky behaviors that may reflect facets of a deviant peer group lifestyle. These behaviors may occur to show opposition to adult authority, to show peer group solidarity, or as an expression of a desire for independence (Donovan & Jessor, 1985; Warren et al., 1997).

The relationship between teen sexual behavior and cigarette smoking is not merely an expression of health-compromising behaviors (e.g., malnutrition or lack of exercise; Turbin, Jessor, & Costa, 2000). These two behaviors empirically cluster along with other deviant behaviors more strongly than with health compromising behaviors (Bardone et al., 1998; Busen, Modeland, & Kouzekanani, 2001; Donovan & Jessor, 1985; Poulin & Graham, 2001; Turbin, Jessor, & Costa, 2000; Warren et al., 1997; Wolf & Freedman, 2000). Even in one study that found aggression and delinquency to load as separate problem-prone behavior factors from a substance use factor, cigarette smoking, other substance use, and sexual activity loaded together on the same factor (Willoughby, Chalmers, & Busseri, 2004). Thus, teen smoking and sexual behavior are more intimately related than are other problem behaviors. In other words, teen smoking and sexual behavior appear to be expressing the same specific functions. One may speculate that these functions pertain to risky behaviors that involve mutual consent and do not intend to harm directly the person or property of others, but do express rebellion from adult authority. More research is needed to uncover the specific shared functions.

Cigarette Smoking and Sexual Behavior as "Substitute Addictions"

Cigarette smoking and sexual behavior may not only co-occur as teens first experiment with a number of risky behaviors. It is plausible that these two behaviors may begin to co-exist among teens and emerging adults who have all ready suffered serious drug problems (Gorski & Miller, 1986; Shrier et al., 1997). Persons in recovery from drug addictions may engage in substitute behaviors that serve similar pleasurable functions as did their drug of choice (Gorski & Miller, 1986; Murphy & Hoffman, 1993; Sussman, Patten, & Order-Conners, 2005; Sussman & Ames, 2001).

Sometimes these behaviors are referred to as "substitute addictions" (Gorski & Miller, 1986; Murphy & Hoffman, 1993; Sussman & Ames, 2001). For example, smoking and sexual behavior have been depicted as substitute addictions for abuse of pain killers or cocaine in recent popular recovery films (e.g., Sandra Bullock in "28 Days" [2000], Michael Keaton in "Clean and Sober" [1988]). While not healthy, smoking and sexual behavior have been

portrayed (sometimes even by persons in recovery) as not being as immediately hazardous as alcohol or illegal drug use (Gorski & Miller, 1986). These behaviors are viewed as common or even tolerated aspects of early recovery, until life processes are normalized (Murphy & Hoffman, 1993). However, there is almost no research literature in this arena. Future work should investigate the co-variation of smoking and sexual behavior as potential substitute addictions for drug abuse patients.

Cigarette Smoking as a Fetish

In the previous sections the co-variation of smoking and sexual behavior has been explained through common intrapersonal or extrapersonal functions, or as a cluster of lifestyle factors. Then these two behaviors were examined as serving a potential common substitute addiction function for those in recovery from drug abuse. There is at least one other perspective toward the examination of these two behaviors. Both could be viewed by some persons as serving a common sexual-related function. A search on Google using the words "cigarette smoking fetish" revealed 309 sites on November 17, 2004, 321 sites on December 1, 2004, and 340 sites on March 17, 2005. A few sites merely contain pictures of females smoking. However, most sites contain explicit sexual content, such as oral sex while blowing out smoke, inserting cigarettes into sexual organs, and engaging in different sexual acts while smoking cigarettes. Perhaps the idea that females who smoke are more willing to have sexual relations, or are somehow more sexually interested, colors the tendency to experience this fetish. Unfortunately there is no research literature to substantiate that smoking is considered a popular or notable sex-related fetish a common sexual-related function of smoking with other sexual behaviors might explain some of the variance for the co-variation of smoking with sexual behavior among teens and is worth pursuing as a research area in the future.

NEGATIVE CONSEQUENCES OF THE ASSOCIATIONS OF CIGARETTE SMOKING AND SEXUAL BEHAVIOR

The co-occurrence of these two behaviors is likely to increase the likelihood of various emotional and physical consequences. Participation in both smoking and early sexual behavior results in even lower self-reports of quality of life than reports by those who engage in one behavior or the other, but not both (Topolski et al., 2001). Also, teens who engage in early sexual behavior and cigarette smoking tend to report more alienation, depression, lower self-esteem, and less life satisfaction (Hallfors et al., 2004; Sussman & Ames, 2001; Topolski et al., 2001; Turbin, Jessor, & Costa, 2000). It is not clear if engagement in smoking and sexual behavior first leads to negative emotional states (e.g., shame), or if both negative emotions and behaviors reflect the

same underlying factor (e.g., problem-proneness). It is plausible, though, that negative emotions, smoking, and teen sexual behavior do impact each other over time, as a negative spiral of despair (e.g., Hallfors et al., 2004).

The physical consequences resulting from co-occurrence of cigarette smoking and sexual behavior are numerous. Those men and women who have multiple sexual partners during their lifetime and also are current smokers are relatively likely (up to ten times as likely) to suffer from anal cancer (Daling et al., 2004) and herpes simplex virus type 2 (Cherpes et al., 2003, female subjects). Further, sexual behavior may place one at risk for human papillomavirus (HPV) or cervical cancer, and cigarette smoking may lead to LSIL (low-grade squamous intraepithelial lesions) complications of HPV (Deacon et al, 2000; Minkoff et al., 2004; Moscicki et al., 2001; Wolf & Freedman, 2000), and may facilitate development of cervical cancer (Deacon et al., 2000; Reid, 2001). Men who smoke tend to be more likely to suffer impotence (2.0% among nonsmokers versus 3–7% among smokers; Mannino, Klevens, & Flanders, 1994), and women who smoke are relatively likely to suffer birth complications (U.S. DHHS, 1994). Since the co-occurrence of smoking and sexual behavior is emotionally and physically dangerous, programming should be developed to attempt to prevent their occurrence and co-occurrence.

PREVENTION PROGRAM DEVELOPMENT IMPLICATIONS

There are several program implications derived from the fact that smoking and compulsive sexual behaviors tend to co-occur. First of all, each behavior may serve as an initial screening device for the other. In other words, the fact that a young teen is a smoker also cues the clinician that the youth is at risk for early sexual behavior, and the converse. The health professional might use affirmative responses to one of these behaviors as an indication that one should assess the other as well (Busen, Modeland, & Kouzekanani, 2001).

Second, there does seem to be an indication that these behaviors both reflect addiction processes, and that any programming may need to offer life-long solutions to what may be an underlying neurotransmission defect (Sussman & Unger, 2004). Such solutions may include encouragement of service work, church involvement, physical activity, medications, or cognitive coping strategies to live with a relatively chronic imbalance of one's set point and ideal state (Sussman & Unger, 2004).

Third, as suggested by Jessor and colleagues, if the difficulty is one of problem-proneness, possibly problem-proneness constructs (alienation, general tolerance of deviance, lack of prosocial institutional attachments) should be addressed in prevention programming (Jessor & Jessor, 1977). For example, prevention professionals might try to install a positive future orientation among teens, teach them social responsibility, and help them to

attach better to their family and school teachers, as opposed to only targeting prevention of cigarette smoking or sexual behavior per se.

One limitation to this perspective is worth noting. The association of cigarette smoking and sexual behavior among teens averages around $r = .35$ ($SD = .28$; Basen-Engquist, Edmundson, & Parcel, 1996; Guilamo-Ramos, Litardo, & Jaccard, 2005). Thus, well over two-thirds of the variance is unique among these two behaviors, suggesting that factors additional to general problem-proneness need examination and modification. Possibly, media and other social influences that focus separately on smoking and sexual behavior need to be modified, for example, through educational programming (Sussman & Ames, 2001).

Fourth, the cultural implications of these behaviors vary across age groups. In relation to young teens, any smoking and any sexual behavior is likely to be viewed as problem prone. For them, programming will tend to emphasize abstinence if possible. For older teens and emerging adults, regular smoking and risky sexual behavior (e.g., unsafe sex, multiple partners) are likely to be viewed as problem prone. For them, programming will tend to emphasize abstinence regarding smoking but also "normal" and safe sexual behavior as a goal (Stuart-Smith, 1996). Thus, programming will need to vary as a function of age group and normative patterns of sexual behavior.

Fifth, while educational programming is important, some emphasis on environmental-contextual changes may be needed as well. For example, corrective information regarding media images may need to be provided through use of counter-advertisements, or misleading media images perhaps should be limited through policy enactment to protect the public's health (Brown & Witherspoon, 2002). As another example, means to assist poor teens by provision of educational and financial assistance might provide indirect support against resorting to smoking and sexual behavior as a means of coping or as a demonstration of identification with a lower socioeconomic status lifestyle (Blum et al., 2000). It is not clear to what extent policies that target no-smoking and sexual abstinence among teens are effective (Stuart-Smith, 1996). There is some evidence that no-smoking policies may be effective (Sussman, Patten, & Order-Conners, 2005). However, research on the utility of enforcing sexual abstinence policies is needed. One may speculate that enforcement of sexual abstinence among teens is nearly impossible and may not be ethical (Hwang & Stewart, 2004).

Finally, program development studies should be completed to find out to what extent dual instruction would be viewed as reasonable in prevention programming (Sussman & Ames, 2001). Anecdotally, instruction in sexual education may "flood the field;" that is, may direct youth interest away from instruction of any other health topic that is being co-taught. Ability to teach multiple preventive behaviors along with sexual behavior needs to be investigated. In the only rigorously evaluated program to reduce substance use and postpone sexual behavior (All Stars; McNeal et al., 2004), targeted

changes were elicited on normative beliefs and lifestyle incongruence as mediating processes. Thus, it would appear possible to impact on these two among middle school youth, with a focus on manipulating norms regarding the appropriateness these behaviors (e.g., though provision of conservative majority norms), and assisting youth in obtaining a more comfortable lifestyle (e.g., alternatives information). Much more such work is needed to uncover programming that might counteract the operation of any or all of the eight reasons for cigarette smoking and sexual behavior co-occurrence described in this paper.

SUMMARY

Much of the information above suggests that cigarette smoking and teen sexual behavior are associated with a syndrome of problem behaviors—that compulsive behaviors represent behavioral manifestations of similar underlying processes among teens (e.g., Hovarth, 1999). The fact that many persons who engage in other compulsive problem behaviors also report cigarette smoking strongly suggests common impulsive-compulsive etiology. Of course, there is considerable variation here. There are many individuals who exhibit only one compulsive problem behavior. After they quit that behavior (e.g., smoking), no substitution behavior occurs. There are other individuals who engage compulsively in several behaviors at once (e.g., drugs, overeating, compulsive sexual behavior, gambling). There are still others who engage in one behavior at a time, but always seem to be battling one compulsive problem behavior after another (Sussman & Ames, 2001). Certainly, much more research is needed to better understand the relations among cigarette smoking and sexual behavior, as well as generate effective prevention strategies for both of these behaviors.

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