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## Illicit Drug Use in Heavy Smokers With and Without Schizophrenia

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### Abstract

**Objective**—The prevalence of cigarette smoking among people with schizophrenia is greater than that of the general population. Because smoking and use of other drugs covary, we examined illicit drug use in current smokers not trying to quit or reduce their tobacco use. We recruited outpatient participants who had a DSM-IV diagnosis of schizophrenia or schizoaffective disorder (schizophrenia, n=70) and a control group who had no Axis I psychiatric disorders (control, n=97). During a 2-3 hour session, participants completed demographic and research questionnaires, including the Drug Use Survey (DUS).

**Results**—Participants with schizophrenia were older than controls ( $p<0.001$ ) and smoked more cigarettes per day ( $p=0.01$ ), but did not differ in degree of nicotine dependence. Ever using a drug was similar between the groups, except that significantly more participants with schizophrenia

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### Contributors

Ms. Mackowick managed the literature searches, aided in data cleaning, and prepared the manuscript.

Dr. Heishman assisted in the development of the protocol and the manuscript.

Dr. Wehring assisted in the study data analysis plan and manuscript preparation.

Ms. Liu coordinated study data collection, cleaning and management, and ran the statistical testing and reporting of results.

Dr. McMahon assisted in protocol development and statistical testing, and assisted in manuscript preparation.

Dr. Kelly designed and wrote the study protocol and assisted in writing the manuscript. She supervised the study procedures, regulatory compliance, and data dissemination plan.

All authors reviewed, edited, contributed to, and have approved the final manuscript.

### Conflict of Interest

Kristen M. Mackowick has nothing to disclose.

Stephen J. Heishman has nothing to disclose.

Heidi J. Wehring has nothing to disclose.

Fang Liu has nothing to disclose.

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reported ever using hallucinogens ( $p < 0.001$ ) and inhalants ( $p = 0.001$ ). For alcohol, cocaine, and marijuana, fewer participants with schizophrenia were current users, but more participants with schizophrenia were past users ( $p < 0.0001$ ). Heavy smokers from the general population continued to use illicit drugs throughout their lives, while schizophrenia participants had the highest period of illicit drug use in their 20's.

**Conclusions**—These data suggest that illicit drug use tends to be high in heavy cigarette smokers, regardless of a schizophrenia diagnosis. However, while illicit drug use is high across the lifespan of heavy smokers in the general population, heavy smokers with schizophrenia use illicit drugs mostly in the first decade of their illness.

## Keywords

schizophrenia; smoking; cigarettes; tobacco; drug use; alcohol; marijuana

## 1. Introduction

Cigarette smoking is the leading preventable cause of death in the Western world (Mokdad et al., 2004). The prevalence of smoking in the United States adult population is approximately 20%, with more than 8 million people sick or disabled because of their tobacco use; Additionally, 450,000 people die from smoking related illnesses each year (Giovino, 2002; Schroeder and Warner, 2010). Those with mental illness or substance-use disorders are more susceptible to these diseases because they smoke more cigarettes per day and have more difficulty quitting (Dalack et al., 1998; de Leon 1996; de Leon et al., 2002; Hughes et al., 1986; Kelly et al., 2011).

The prevalence of cigarette smoking among people with schizophrenia is 58-90% (de Leon et al., 2002; Grant et al., 2004; Lasser et al., 2000). Although the exact causes of the high smoking prevalence in schizophrenia populations are unknown, an interaction of factors such as boredom, reward for good behavior, self-medication, and reduction of negative antipsychotic side effects is thought to be involved (Hughes et al., 1986; Simosky et al., 2002). Additionally, studies have suggested that nicotinic acetylcholine receptors (nAChRs) may contribute to the pathophysiology of schizophrenia (Leonard et al., 2000), as schizophrenia patients tend to have reduced nAChR expression compared with controls (Fonder et al., 2005; Breese et al., 2000). Schizophrenia patients tend to be heavier smokers than smokers in the general population, which is reflected in higher morbidity and mortality rates (Kelly et al., 2011; Saha et al., 2007). Among schizophrenia patients age 35-54 who smoke, the odds of cardiac death were increased 12-fold relative to nonsmokers (Kelly et al., 2011). Despite these increased risks, quit rates among people with schizophrenia remain low (de Leon, 1996; Lasser et al., 2000), especially among those patients treated with first generation antipsychotics (George et al., 2000).

A significant cause for concern in the schizophrenia population, in addition to increased morbidity and mortality rates (Goff et al., 2005; Kelly et al., 2007), is that cigarette smoking and use of other drugs often covary (SAMHSA, 2010). Comorbid schizophrenia and substance abuse has risen dramatically in recent years, from about 30% prevalence in the 1970s to approximately 60% by 1990 (el Guebaly and Hodgins, 1992; Fowler et al, 1998; Gogek, 1991; Searles et al., 1990; Westermeyer, 2006). Deinstitutionalization, psychiatric care budget reductions, and disability payments likely contribute to this rise in comorbidity (Klatte et al., 1969; Ridgely and Willenbring, 1992). Among inpatients, the prevalence of current substance abuse or dependence ranges from 8% to 42%, and lifetime abuse or dependence ranges from 22% to 70% (Kovaszny, 1991; Owen et al., 1996; Sanguineti & Samuel, 1993; Soyka et al., 1993). For outpatients, the prevalence of current abuse or dependence ranges from 6% to 27%, and lifetime abuse or dependence ranges from 51% to

60% (Chouljian et al., 1995; Drake et al., 1990; Fowler et al., 1998). The Epidemiological Catchment Area (ECA) Study found that the odds of someone having a substance abuse diagnosis who was also diagnosed with schizophrenia was 4.6 times higher than for the rest of the population (Regier et al., 1990). The combination of a psychiatric disorder with a substance use disorder greatly increases the chance that an individual will need psychological and health services (Kessler et al., 1997), be more aggressive (Angermeyer, 2000; Soyka, 2000), and be less compliant with their medication (Pristach and Smith, 1990; Swartz et al, 1998). Among schizophrenia patients, we have found that rates of using alcohol, cannabis, cocaine, heroin, and other drugs of abuse were higher in smokers than in nonsmokers (Kelly et al., 2011). Drugs of abuse can also hasten the onset of schizophrenia or exacerbate the pre-existing illness. For example, pre-onset cannabis use might elicit psychotic and prodromal symptoms sooner than if there were no cannabis use (Compton et al., 2009).

Although this issue has not been studied in people with schizophrenia, nicotine use may be a gateway to other drug use, as smoking in adolescence significantly increases the probability of drug use and drug use disorders in early adulthood (Lewinsohn et al., 1999). Sixty-eight percent of individuals diagnosed with substance abuse or dependence are current smokers (Lasser et al., 2000). Among those receiving treatment for addiction, smokers have an increased mortality risk above that of their non-smoking, addiction treatment-seeking counterparts (Hser et al., 1993, 1994; Hurt et al., 1996). Cross-tolerance or cross-sensitization to the effects of a drug can develop when there is prior use of other drugs (Agrawal et al., 2008; Hoving et al., 2007; Kalant, 1996; Patton et al., 2005). Bechtholt and Mark (2002) reported that animals given the highest dose of nicotine showed a significant increase in number of self-administered cocaine infusions by the eighth day of nicotine treatment. Similarly in humans, cocaine users are more likely to smoke cigarettes than non-users, and cigarette use increases during cocaine use (Higgins et al., 1994; Roll et al., 1996). Increased cue-induced cocaine craving following nicotine administration, and subsequent decreased cocaine craving with nicotinic antagonist administration, has also been reported in cocaine addicts (Reid et al., 1998, 1999).

There are few data, beyond those reported in the ECA study (Regier et al. 1990), on the correlation of cigarette smoking and drug use in schizophrenia patients and comparing the findings to a control cohort. Because of the correlation between smoking and drug use, as well as the high prevalence of cigarette smoking and comorbidity in schizophrenia populations, we investigated whether the prevalence of illicit drug use in smokers with schizophrenia was greater compared to drug use prevalence in a group of smokers without schizophrenia.

## 2. Study Design and Methods

### 2.1 Participants

We recruited smokers who were not seeking treatment for tobacco or substance dependence, were between 18-65 years old, smoked at least 5 cigarettes per day, and had a breath carbon monoxide (CO)  $\geq$  8 parts per million (ppm). We recruited individuals with a DSM-IV diagnosis of schizophrenia or schizoaffective disorder and those with no major Axis-I psychotic disorder (controls), as determined by the Structured Clinical Interview for Axis-I DSM-IV disorders (SCID). Schizophrenia volunteers were recruited from the Maryland Psychiatric Research Center (MPRC). Only outpatients with schizophrenia were included because of restrictions on cigarette use among inpatients. Control volunteers were recruited by the National Institute on Drug Abuse (NIDA) via print, radio, and television advertisements. Subjects were compensated for their time and travel. University of

Maryland, Maryland State Department of Health and Mental Hygiene, and NIDA Institutional Review Boards approved study procedures.

## 2.2 Procedures

Study participation consisted of one session lasting 2-3 hours. Following consent, screening procedures took place including a breath CO measurement and SCID. At the conclusion of screening and demographic interviews, participants smoked one preferred-brand cigarette to standardize the time since last tobacco exposure. After the cigarette, study assessments began and breath CO was measured 10-15 minutes after the cigarette. Study assessments included a semi-structured interview and research questionnaires. To measure CO, participants exhaled fully, inhaled deeply, and held their breath for 20 seconds before exhaling into a portable monitor (Vitalograph, Lenexa, KS).

## 2.3 Measures

The Drug Use Survey (DUS; Smith et al., 1992) was used to assess lifetime and current drug use. Questions included were: a) have you ever used a substance? (alcohol, heroin, cocaine, marijuana, amphetamines, hallucinogens, inhalants); b) have you used this substance more than 5 times?; c) when was your last use? (  $\leq$  30 days [current use] vs.  $>$  30 days [past use]); d) at what age did you first use this substance?; e) what is your substance of choice?; and f) how much money have you spent on drugs/alcohol in the past 30 days?

The 12-item Tobacco Craving Questionnaire-Short Form (TCQ-SF) (Heishman et al., 2008) was used to assess tobacco craving in four dimensions: Emotionality (anticipation of relief from withdrawal symptoms or negative mood), Expectancy (anticipation of positive outcomes from smoking), Compulsivity (lack of control over smoking), and Purposefulness (intention and planning to smoke for positive results). The TCQ-SF was administered immediately and approximately 15 minutes after smoking the cigarette. The Fagerström Test for Nicotine Dependence (FTND) (Heatherton et al., 1991, Steinberg et al., 2005) was used to assess degree of nicotine dependence.

## 2.4 Statistical Analysis

Differences in demographic characteristics and history of drug use between smokers with and without schizophrenia were examined using t-tests for continuous variables and chi-square tests for categorical measures. Associations between the groups with respect to dimensions of craving on the TCQ-SF were examined with two way analysis of variance according to use of specific illicit substances.

## 3. Results

### 3.1 Population

One hundred sixty-seven smokers were enrolled in this study (N=70 schizophrenia outpatients and N=97 controls). The demographic and clinical characteristics are listed in Table 1. The schizophrenia group was older ( $p < 0.001$ ) and had more Caucasians ( $p = 0.006$ ). Schizophrenia participants and controls had similar FTND scores, but the schizophrenia group smoked more cigarettes per day ( $p = 0.01$ ), had higher levels of expired CO ( $p = 0.01$ ), and had higher TCQ-SF scores ( $p = 0.002$ ). Within the schizophrenia group, there were no differences in number of cigarettes per day ( $p = 0.37$ ) or FTND scores ( $p = 0.72$ ) based on antipsychotic metabolism by CYP1A2.

### 3.2 Drug Use Survey (DUS)

Across all drug categories, lifetime drug use was similar, except that more schizophrenia participants than controls reported ever using hallucinogens ( $p = 0.001$ ) and inhalants ( $p = 0.001$ ). The percentages among participants who used a drug more than 5 times were similar in smokers with and without schizophrenia for all drugs except heroin and cocaine. Schizophrenia participants were less likely than controls to use heroin ( $p = 0.006$ ) or cocaine ( $p = 0.003$ ) more than 5 times (see Table 2). Notably, less than 3% of schizophrenia participants reported current use of any drug other than alcohol (17% current use), whereas considerably higher percentages of controls reported current use of some drug (alcohol 69%, heroin 12%, cocaine 25%, marijuana 45%). However, more schizophrenia participants than controls reported past, but not current, use of some substances (alcohol 71% vs. 29%, cocaine 51% vs. 34%, marijuana, 84% vs. 49%) with most having not used for more than a year. Fewer schizophrenia participants than controls were current heroin users (0% vs. 12%), but the percentage of past heroin users was the same between groups (see Table 3). Controlling for age, most current substance use occurred between the ages of 20 and 30 for both groups. The rates of current use were comparable between controls and schizophrenia participants at younger ages and then became more discrepant as participants got older. The rates of current use declined for schizophrenia participants but not for controls. This trend was strongest for alcohol ( $p < 0.0001$ ) and marijuana ( $p = 0.002$ ; figure 1), as these groups had the highest numbers of reported current users, but a similar pattern was also seen for other drugs of abuse. When asked about past treatment history, more schizophrenia participants than controls reported seeking alcohol treatment ( $p = 0.009$ ), but not drug treatment ( $p = 0.977$ ).

### 3.3 Relationship of Cigarette Smoking Variables to Drug Use

We examined the relationship between current cigarette smoking, tobacco craving, and drug use. Cocaine use was associated with greater TCQ-SF scores in schizophrenia participants, but not in controls ( $p = 0.0072$ ; see Table 4). We also examined the relationship between the number of cigarettes smoked, expired CO, FTND scores, current tobacco craving, and each substance of abuse. No drug of abuse was related to any measure of cigarette smoking.

### 3.4 Drug of Choice and Illicit Drug Spending

The drugs of choice reported most frequently by controls were cigarettes and marijuana (31% for both substances). The drug of choice reported most frequently by schizophrenia participants was cigarettes (64%). More schizophrenia participants than controls chose alcohol and cigarettes as their drugs of choice ( $p < 0.0001$ ). Schizophrenia participants also reported spending less money on illicit drugs and/or alcohol in the past 30 days (mean = \$119) than controls (mean = \$384;  $p = 0.01$ ), as well as a smaller percentage of their monthly income (13.6% vs. 19.8%;  $p = 0.01$ ).

## 4. Discussion

The co-occurrence of schizophrenia, tobacco dependence, and drug use remains a serious health problem and a barrier to improving this population's health and quality of life. We hypothesized that the higher prevalence of cigarette use in the schizophrenia population would be correlated with greater drug use. However, we found that a smaller percentage of schizophrenia participants were current users of illicit substances than control smokers. We also found that the number of current drug users with schizophrenia declined with increasing age compared to controls. This suggests that cigarette smoking is not associated with increased illicit drug use in smokers with schizophrenia compared with controls who had a similar smoking history. However, schizophrenia participants reported more past substance use than controls, specifically for alcohol, cocaine, marijuana, hallucinogens, and inhalants.

Although we do not know specifically when the drug use occurred, this is a concern, as early-onset drug use may increase an already vulnerable individual's chance of developing psychosis. For example, Caspi et al. (2005) found that individuals who possess the Val allele (Val/Val or Val/Met) on the COMT gene and had early-onset cannabis use were at an increased risk of developing psychotic symptoms compared with their adult-onset cannabis use and Met/Met counterparts.

There were also unique patterns of drug use within each of our populations. Although schizophrenia participants used illicit drugs less than controls, they reported higher lifetime rates of inhalant and hallucinogen use. Higher lifetime prevalence of hallucinogen use has been reported among patients with schizophrenia compared with controls or other psychiatric patients (Tsuang et al., 1982; McLellan and Druley, 1977; Breakey et al., 1974). In a South Pacific island population, Daniels and Latham (1984) also found that patients with schizophrenia have higher lifetime prevalence of gasoline inhalation than controls. In this study, we found that controls reported more heroin and cocaine use after they had established a history of past use. This could be due, in part, to regional influences, as Baltimore has high rates of heroin and cocaine use in the general population (ONDCP, 2006). This could also be explained by the fact that cocaine and heroin are expensive illicit drugs that require coordination of effort and intact cognitive function to obtain. Inhalants may be more readily available and less expensive. This is an interesting and troubling finding, as emergency department mentions of inhalant use are on the rise (SAMHSA, 2003) and chronic inhalant use has the potential to produce persistent psychotic symptoms in individuals at risk for psychosis (Byrne et al., 1991).

Consistent with smoking prevalence rates in the schizophrenia population (de Leon et al., 2002; Lasser et al., 2000; Grant, et al., 2004), we found that the mean number of cigarettes smoked per day was higher in schizophrenia participants than in controls. We also observed that schizophrenia participants had higher levels of breath CO 15 minutes post-cigarette, which is consistent with Tidey et al. (2005) who reported that schizophrenia patients obtained greater CO boosts from smoking than controls. In the current study, schizophrenia participants also reported higher TCQ-SF scores 15 minutes after a cigarette compared with controls (Lo et al., 2011). Interestingly, this tobacco craving was more robust in the schizophrenia participants with a past history of cocaine use. People with schizophrenia are known to have alterations in dopamine in the reward-mediated circuitry (Davis et al., 1991; Howes and Kapur, 2009; Goldstein and Deutch, 1992; Seeman et al., 1987). Administration of cocaine has been shown to increase dopamine levels in this reward pathway (Venton et al., 2006; Daws et al., 2002). The fact that past cocaine use in schizophrenia participants, but not in controls, was associated with current elevated tobacco craving may be due, in part, to this altered reward pathway. Smoking cessation attempts in smokers with schizophrenia with past cocaine use may present a treatment challenge.

Some limitations of this study should be mentioned. Our sample was mostly comprised of heavy smokers who were not married. This may be due to some important behavioral differences between those who smoke and use drugs and those who do not, and this may limit the generalizability of our results. Drug use data were collected retrospectively, and recall bias could have resulted in underestimation or overestimation of drug use. We also did not report past and current illicit drug use by antipsychotic medication in the schizophrenia group because of the wide variety of medication regimens (e.g., only two participants were on aripiprazole). Stuyt et al. (2006) reported that, among dual-diagnosis patients, more subjects on second generation antipsychotics completed a drug treatment program compared with those on first generation antipsychotics. Additionally, within the participants on second generation antipsychotics, those on risperidone and ziprasidone had better treatment outcomes than those on olanzapine, highlighting the mechanism of CYP1A2 metabolism. In

the current study, we did not report past and current illicit drug use by antipsychotic metabolism, but we also did not find any differences in smoking characteristics related to antipsychotic metabolism. Thus, we do not think that this is an adequate explanation for the differential drug use observed. The schizophrenia participants in the present study averaged 9 years older than controls, which might account for the 9 year difference in years smoked between the two groups, but we do not think that years of smoking significantly altered our drug use or nicotine dependence data, as drug use rates were comparable between the two groups at the younger ages. However, the older age in the schizophrenia group might have affected their tendency to use drugs, as drug use generally decreases with age (SAMHSA, 2010). Also, we did not include nonsmokers in this study, which would have allowed for a better appreciation of how drug use, cigarette smoking, and schizophrenia interact. Because of the high rates of tobacco use in the schizophrenia population, and the resulting difficulties that would accompany recruiting schizophrenia patients who do not smoke, we only included smokers in this study. We also did not assess cognitive functioning, depressive symptoms, or negative symptoms, which are likely to influence ease of access to drugs. However, our patients were outpatients, so we think that any clinical symptomatology would not have been severe enough to create significant differences in drug use patterns between the two groups. A strength of this study is that we were able to recruit large numbers of participants for both the schizophrenia and control groups, so our analyses yielded valid comparisons. We also studied outpatients with schizophrenia who were not constrained by institutional rules or smoke-free campuses, which increased the external validity of our data.

The prevalence of schizophrenia patients with comorbid substance abuse is increasing (Westermeyer, 2006; Searles et al., 1990; Fowler et al, 1998; el Guebaly and Hodgins, 1992; Gogek, 1991). Although our data suggest lower levels of current substance use in smokers with schizophrenia compared to controls, we found a substantial history of past substance use among the schizophrenia participants, especially those between the ages of 20 and 30. Enhanced efforts to treat tobacco dependence in people with schizophrenia are needed, not only for the obvious health benefits, but to help protect against initiation of drug use. Clinicians should also be vigilant when treating schizophrenia patients who are in the early stages of their illness, as prodromal and first-episode patients may be more vulnerable to drug use, as we observed more past drug use than current use in our schizophrenia participants.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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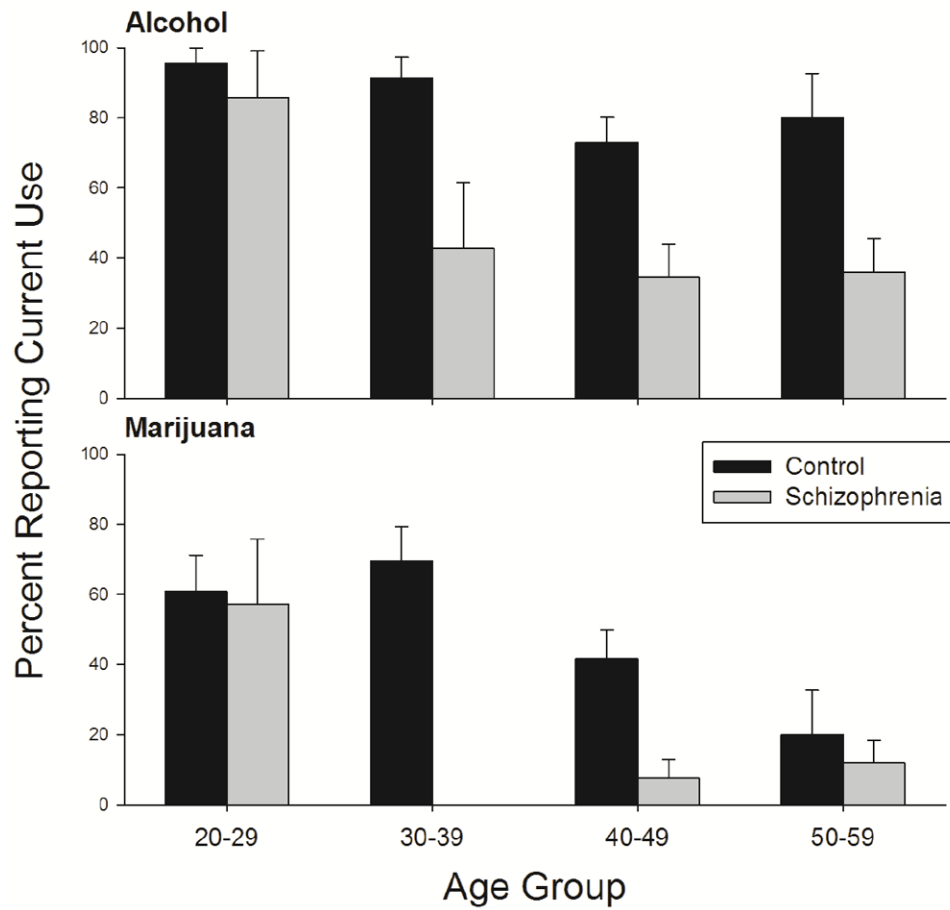
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**Figure 1.** Percentage of participants who reported current alcohol (top panel) and current marijuana (bottom panel) use by age group.

**Table 1**

## Demographic and Clinical Characteristics

	Schizophrenia (N = 70)	Controls (N = 97)	Statistics
Age (y, mean)	46.1 ± 10.2	37.2 ± 10.7	$t = 5.42, df = 165, P < 0.0001$
Sex (male)	51 (73%)	63 (65%)	$\chi^2 = 1.17, df = 1, P = 0.28$
Race			$\chi^2 = 14.45, df = 4, P = 0.006$
Caucasian	41 (59%)	31 (32%)	
African American	27 (39%)	64 (66%)	
Other races	2 (3%)	2 (2%)	
Level of education (y)	12.1 ± 2.0	11.8 ± 1.8	$t = 1.05, df = 162, P = 0.30.$
Marital status			$\chi^2 = 1.68, df = 3, P = 0.64$
Presently married	3 (4%)	9 (9%)	
Widowed	1 (2%)	2 (2%)	
Divorced/Separated	15 (22%)	22 (23%)	
Single (never married)	49 (70%)	63 (65%)	
FTND total	5.5 ± 2.0	5.3 ± 1.9	$t = 0.52, df = 163, P = 0.60$
Number of cigarettes smoked daily	21.3 ± 11.7	17.1 ± 7.9	$t = 2.6, df = 113, P = 0.01$
Expired CO (15 mins post-cig)	27.7 ± 15.3	22.6 ± 7.9	$t = 2.5, df = 96, P = 0.01$
TCQ-SF total (15 mins post-cig)	48.2 ± 19.3	38.9 ± 19.6	$t = 3.0, df = 165, P = 0.002$
Years of smoking	28.5 ± 10.7	19.9 ± 11.0	$t = 5.0, df = 163, P < 0.0001$
CYP1A2 metabolized antipsychotic	27 (39%)		

**Table 2**

Ever using and using more than 5 times

	Schizophrenia (N = 70)	Controls (N = 97)	Statistics
Ever use			
Alcohol (n, %)	67 (95.7%)	95 (97.9%)	$\chi^2 = 0.69, df = 1, P = 0.41$
Heroin	24 (34.3%)	45 (46.4%)	$\chi^2 = 2.46, df = 1, P = 0.12$
Cocaine	37 (52.9%)	57 (58.8%)	$\chi^2 = 0.58, df = 1, P = 0.45$
Marijuana	61 (87.1%)	91 (93.8%)	$\chi^2 = 2.21, df = 1, P = 0.14$
Amphetamines	19 (27.1%)	22 (22.7%)	$\chi^2 = 0.44, df = 1, P = 0.51$
Hallucinogens	34 (48.6%)	24 (24.7%)	$\chi^2 = 10.18, df = 1, P = 0.001$
Inhalants	15 (21.4%)	5 (5.2%)	$\chi^2 = 10.21, df = 1, P = 0.001$
More than 5 times			
Alcohol (n, % of lifetime users)	66 (98.5%)	90 (94.7%)	$\chi^2 = 1.57, df = 1, P = 0.21$
Heroin	13 (54.2%)	38 (84.4%)	$\chi^2 = 7.44, df = 1, P = 0.006$
Cocaine	27 (73.0%)	54 (94.7%)	$\chi^2 = 8.92, df = 1, P = 0.003$
Marijuana	52 (85.3%)	81 (89.0%)	$\chi^2 = 0.47, df = 1, P = 0.49$
Amphetamines	12 (66.7%)	13 (61.9%)	$\chi^2 = 0.09, df = 1, P = 0.76$
Hallucinogens	18 (52.9%)	13 (54.2%)	$\chi^2 = 0.008, df = 1, P = 0.93$
Inhalants	12 (80.0%)	3 (60.0%)	$\chi^2 = 0.80, df = 1, P = 0.37$

**Table 3**

Days since reported last use

Current use / Past use <sup>a</sup>	Schizophrenia (N = 70)			Controls (N = 97)			Statistics
	Current	All past	No use	Current	All past	No use	
Alcohol (n, %)	17 (24.3)	50 (71.4)	3 (4.3)	67 (69.1)	28(28.9)	2 (2.0)	$\chi^2 = 32.7, df=2, P < 0.0001$
Heroin	0 (0)	24 (34.3)	46 (65.7)	12 (12.4)	33 (34.0)	52 (53.6)	$\chi^2 = 9.7, df=2, P = 0.008$
Cocaine	1 (1.4)	36 (51.4)	33 (47.1)	24 (24.7)	33 (34.0)	40 (41.3)	$\chi^2 = 18.1, df=2, P < 0.0001$
Marijuana	2 (2.9)	59 (84.3)	9 (12.8)	43 (44.8)	47 (49.0)	6 (6.2)	$\chi^2 = 36.1, df=2, P < 0.0001$
Amphetamines	1 (1.5)	17 (24.6)	51 (73.9)	3 (3.1)	18 (18.8)	75 (78.1)	$\chi^2 = 1.2, df=2, P = 0.55$
Hallucinogens	1 (1.4)	33 (47.2)	36 (51.4)	1 (1.0)	23 (23.7)	73 (75.3)	$\chi^2 = 10.2, df=2, P = 0.006$
Inhalants	0 (0)	14 (20.3)	55 (79.7)	0 (0)	5 (5.2)	92 (94.8)	$\chi^2 = 9.1, df=1, P = 0.0025$

<sup>a</sup>Current: < 30 days; Past: no use for 30 days

Table 4

TCQ total scores by diagnosis and cocaine use

	Schizophrenia				Controls				Statistics
	Cocaine	n	Mean	SD	n	Mean	SD	SD	
Total score	Yes	37	50.6	18.3	57	39.4	18.1	18.1	$t = -2.72, df = 163, P = 0.0072$
	No	33	45.6	20.2	40	38.4	21.6	21.6	$t = -1.57, df = 163, P = 0.1191$
Emotionality	Yes	37	12.2	5.3	57	7.9	4.9	4.9	$t = -3.88, df = 163, P = 0.0001$
	No	33	9.5	5.0	40	8.5	6.1	6.1	$t = -0.78, df = 163, P = 0.4352$
Expectancy	Yes	37	13.2	5.6	57	12.0	6.0	6.0	$t = -0.94, df = 163, P = 0.3492$
	No	33	12.2	6.3	40	11.2	6.9	6.9	$t = -0.72, df = 163, P = 0.4746$
Compulsivity	Yes	37	11.4	5.6	57	8.1	5.1	5.1	$t = -2.86, df = 163, P = 0.0047$
	No	33	10.8	6.2	40	8.0	5.5	5.5	$t = -2.19, df = 163, P = 0.0299$
Purposefulness	Yes	37	13.7	4.9	57	11.4	5.2	5.2	$t = -1.99, df = 163, P = 0.0484$
	No	33	13.0	5.7	40	10.7	6.0	6.0	$t = -1.80, df = 163, P = 0.0741$