



Interview as intervention: The case of young adult multidrug users in the club scene

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ABSTRACT

This paper reports on changes in substance use and substance dependence symptoms—without intervention—among young adult multidrug users in the club scene, ages 18–29, ($N=444$) who participated in a natural history study. Computer-assisted personal interviews at baseline and 6-, 12-, and 18-month follow-ups included well-tested measures of substance use and dependence. Changes in substance dependence symptoms and drug use frequencies were calculated using Cohen's d statistic. Mean age was 22; 40% were female; 58% were Hispanic, 17% White, and 21% Black. At 18-month follow-up assessment, participants reported significantly fewer days of cocaine ($d=-.85$ at 18months), ecstasy ($d=-.93$), benzodiazepine ($d=-.82$), and prescription opioid ($d=-.81$) use, as well as reduced substance dependence symptoms ($d=-.42$). These results, together with data from focus groups with completers, suggest that comprehensive health and social risk assessments may have quite strong intervention effects among young adult multidrug users.

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1. Introduction

The modern all-night dance club culture has its most recent roots in the adolescent rave and gay male circuit party subcultures that emerged in the late 1980s, with more distant connections to the earlier New York nightclub scene epitomized by Studio 54 (Fritz, 1999; Kurtz & Inciardi, 2003; Silcott, 1999; Thornton, 1996). This type of nightlife is found in almost every large city, but is especially prevalent in major tourist destinations, including Miami, where people tend to look for an escape from their routines (Owen, 2003; Shister, 1999; Uriely & Belhassen, 2006).

Except for MDMA (ecstasy), which has been a relative constant, the most common “club” or “dance drugs” have tended to vary over time and location, and have included such diverse substances as powder cocaine, methamphetamine, ketamine, rohypnol, gamma-hydroxybutyric acid (GHB), and LSD over the past two decades (Beck & Rosenbaum, 1994; Measham, Aldridge, & Parker, 2001; Reynolds, 1998; Sanders, 2006; Thornton, 1996). Since the late 1990s, as the non-medical use of prescription medications became more widespread, these drugs have also become popular in the club scene—most typically benzodiazepines and opioids (Chase, 2003; Chu, et al., 2003; Kelly & Parsons, 2007; Kurtz, Inciardi, Surratt, & Cottler, 2005; Oliver & Keen, 2003). Alcohol use is also ubiquitous among club drug users (Kurtz, et al., 2005; Mitcheson, McCambridge,

Byrne, Hunt, & Winstock, 2008) but tends to supplement rather than substitute for club drug use (Hammersley, Ditton, Smith, & Short, 1999; Kurtz, 2004).

One of the attractions to these substances among the young adults who predominate in the club scene is the increased stamina that they engender, enabling participants to dance all night, as well as their intoxicating, euphoric, disinhibiting and sometimes hallucinogenic effects that are said to deepen the club or dance experience (Fritz, 1999; Reynolds, 1998; Silcott, 1999). The drugs, like other aspects of the club culture, are usually portrayed as the height of fashion, exclusivity, and trendiness (Cooper, 2007; Thornton, 1996).

Because of their tendency to mix numerous drugs during their typical drug binges, club drug users are at high risk for health problems (Boyd, McCabe, & d' Arcy, 2003; Cottler, Womack, Compton, & Ben Abdallah, 2001; Freese, Miotto, & Reback, 2002). Ecstasy and other club drug use have been linked to high-risk sexual behaviors (Klitzman, Greenberg, Pollack, & Dolezal, 2002; Mattison, Ross, Wolfson, & Franklin, 2001; Semple, Patterson, & Grant, 2002) as well as chronic psychiatric symptoms, including memory problems, depression, anxiety and suicidal ideation (MacInnes, Handley, & Harding, 2001; McCardle, Luebbers, Carter, Croft, & Stough, 2004; Parrott, Milani, Parmar, & Turner, 2001; Roiser & Sahakian, 2004; Schifano, Di Furia, Gorza, Minicuci, & Bricolo, 1998). Similarly, polydrug users in the club scene have reported depressive symptoms and other mental health problems, difficulties with peer, family and other social relationships (Chinet, Stephan, & Zobel, 2007; Medina & Shear, 2007; Singer, Linares, Ntiri, Henry, & Minnes, 2004), and extensive criminal justice involvement (Kurtz, Inciardi, & Pujals, 2009).

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The literature suggests that there are numerous challenges to be confronted in mounting intervention initiatives for club drug users (Marsden, et al., 2006; Whittingham, et al., 2009). First, there appears to be a general sense among members of the club culture that the use of euphoric and hallucinogenic drugs is fun and fashionable, and the recognition among users of problematic aspects of their substance use is quite low (Bellis, Hughes, & Lowry, 2002; Perrone, 2009). As a result, there is expressed resistance to participation in programs framed as formal interventions (Bellis et al., 2002; Knowles, 2001). Second, young men and women in the club scene tend to be suspicious of or disinterested in prevention messages originating from governmental or health authorities, particularly as they relate to the risks of drug use and sex. Instead, they tend to rely on less formal sources of information and education, and to get this information primarily from friends and Internet sites (Carlson, Falck, McCaughan, & Siegal, 2004; Falck, Carlson, Wang, & Siegal, 2004). Taken together, these factors indicate substantial obstacles to the design of effective prevention interventions for this population.

Furthermore, interventions specific to club drug users have been found to be largely unsuccessful, including motivational interviewing (Marsden, et al., 2006) and the dissemination of educational materials (Whittingham, et al., 2009). Fear inducing strategies (providing information about negative outcomes) have also been shown to be generally ineffective for changing behavior (Ruiter, Abraham, & Kok, 2001).

The data presented here are drawn from an 18-month natural history study of 444 high risk club and prescription drug using men and women with ages 18–29 in Miami's club scene. The major goals of the project were to examine the progression of club and non-medical prescription drug use, and to assess changes in health and social consequences of this use over time. This paper reports on unexpected patterns of behavioral risk reduction observed among participants in this natural history study. Supplemented with qualitative data from focus groups conducted with a subsample of study completers ($n=28$), also described herein, the findings suggest that comprehensive health and social risk assessments delivered by same-age peers may have quite strong intervention effects among young adult multidrug users.

We frame these findings within the literature on reactive effects of research and/or clinical assessments among substance users (Clifford & Maisto, 2000; Epstein, et al., 2005; Halkitis, Mukherjee, & Palamar, 2007; Lightfoot, Rotheram-Borus, Comulada, Gundersen, & Reddy, 2007; Marsden, et al., 2006), and conclude with a discussion of the potential importance of the results to the development of appropriate, feasible, and acceptable intervention strategies for the population.

2. Methods

2.1. Research site

Miami-Dade County, Florida, is a diverse community of 2.4 million people with large numbers of foreign-born residents (45.1%) (U.S. Census Bureau, 2010). Hispanics (65.0%) are the largest ethnic group, with non-Hispanic Whites representing 15.4%, and African-Americans/Caribbeans 18.9% of the county population. With the restoration of the South Beach Art Deco Historic District beginning in the early 1990s, Miami has become a national and international destination for partying, sexual tourism, and club drug use. South Beach has also become an East Coast center for the club culture, setting trends that are emulated and replicated elsewhere in the United States, western Europe, and Latin America (Guzman, 1999; Kilborn, 2000; Marr, 2004; Schwartz, 2003; Shister, 1999).

For over four decades, Miami has been both a port of entry and corridor community for the trafficking of illegal drugs, and is a well-known epicenter for the use of cocaine, crack, heroin, and prescription drugs (Eddy, Sabogal, & Walden, 1988; Gugliotta & Leen, 1989;

Inciardi & Pottieger, 1998; Portes & Stepick, 1993; U.S. Drug Enforcement Administration, 2008). Miami has also been designated by the National Drug Intelligence Center (2009) as a High Intensity Drug Trafficking Area where large amounts of prescription drugs are regularly being channeled into the illegal marketplace. As described earlier, a recent trend in this regard has been a significant incursion of prescription drugs into the club culture.

2.2. Study participants

Participants were 18 to 29 years old, willing to provide contact information including a residential address and telephone number for scheduling follow-up appointments, and reported (a) using one or more club drugs (defined as powder cocaine, ecstasy, GHB, ketamine and LSD) at least three times during the past 90 days; (b) using one or more psychoactive prescription medications three times or more in the past 90 days for non-medical reasons (i.e., "we are only interested in the times you used prescription medications other than as prescribed by a doctor, for instance, to get high, for fun, to relax or to come down"); and (c) regularly attending large recognized local nightclubs at least twice per month. The participants described in this report entered the study between May 2006 and June 2008.

Participants were recruited through respondent-driven sampling (RDS) (Heckathorn, 1997), a form of chain referral sampling that aims to minimize the potential sampling bias attributable to narrow social networks. RDS has been shown to quickly reduce sources of respondent bias (such as age, race/ethnicity, gender, and drug of choice) as successive branches or waves of respondents are enrolled and then solicited for additional contacts (Heckathorn, 1997, 2002). In this study, initial respondents ("seeds") were recruited through outreach and existing contacts in the club culture. The seeds were chosen for their diversity in terms of gender, ethnicity, age, and sexual orientation.

Each seed and subsequent study participant was provided with recruitment coupons to give to other club drug users in their social network, with the understanding that they would earn \$50 for the recruitment of each additional eligible respondent. The coupons provided the recipient with information about the study and a telephone number to call for eligibility screening. Each respondent/recruiter was limited to five coupons in order to prevent a few recruiters with large social networks from biasing the overall sample toward those with similar demographic and drug using profiles (homophily) and in order to lengthen the recruitment chains (Heckathorn, 1997). Although participants were not recruited at nightclubs, the clubs they reported patronizing most often were large dance clubs that are focused on the electronic music scene.

At the first formal contact with the field office, interested callers were screened to determine eligibility over the telephone. Those who were eligible and expressed interest in participating were asked to visit the office where trained interviewers explained the confidential nature of the study and the purpose of the project. Those agreeing to participate reviewed and signed informed consent using procedures approved by the University of Delaware's Institutional Review Board (predecessor institution for the project), which follows the Helsinki Declaration of 1975.

2.3. Survey data collection

Following consent, all respondents completed a standardized baseline demographic, behavioral, health history and social risk assessment that took about 2 hours to complete. Private offices were used for all interviews. Data were collected using laptop computer-assisted personal interviews. Follow-up interviews at 6, 12, and 18 months from study entry included the same items as the baseline instrument exclusive of life history items and lasted about 1 hour. Missing a follow-up assessment did not result in disenrollment or

prohibit continued participation in later follow-ups. Two hundred seventy-four participants (61.7%) completed all four assessments, 66 (14.9%) completed baseline plus two follow-ups, 56 (12.6%) completed baseline plus one follow-up, and 48 (10.8%) completed only the baseline assessment. Participants received HIV education literature, condoms, and a \$50 stipend upon completing each assessment.

The Global Appraisal of Individual Needs (GAIN, v. 5.4) (Dennis, Titus, White, Unsicker, & Hodgkins, 2002) was the primary component of the standardized assessments. The interviews assessed demographics, frequencies of past 90day use of alcohol and drugs, *Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV)* substance dependence symptoms, counts of unprotected anal and vaginal sexual encounters, victimization and arrest histories, substance abuse treatment histories, and mental health problems.

The substance dependence measure reflects self-reports of symptoms experienced in the 90days prior to the baseline and follow-up assessments. Mental distress was measured by the General Mental Distress Scale (GMDS), which includes symptoms of somatization (e.g., sleep trouble; shortness of breath or lump in the throat), depression (e.g., feeling sad, lonely, or hopeless; feeling tired or having no energy), and anxiety (e.g., feeling nervous, anxious, or tense; unable to control worries) experienced in the past 12 months. The GMDS scale is further reducible to classifications indicating clinical significance: subclinical, moderate and severe (Dennis, et al., 2002). Alpha reliability coefficients for the depression, anxiety, and somaticism subscales in this study were 0.863, 0.872, and 0.738, respectively.

2.4. Analyses

Data from the interview questionnaires were analyzed using Stata 12.1 for Windows (StataCorp LP, 2012). Descriptive statistics were calculated to describe the sample in terms of demographics, victimization and arrest histories, mental distress, substance dependence and treatment history, sexual behaviors, and past 90day substance use frequencies.

Outcome measures reported here include past 90day cocaine, ecstasy, benzodiazepine and opioid use (these were selected because of their wide prevalence of use), as well as *DSM-IV* substance dependence symptoms. All outcomes were examined based upon the data available for each follow-up wave, rather than limited to those participants who completed all assessments. For drug use outcomes, only participants who reported using a particular substance at their baseline interviews were included in the longitudinal analysis for that substance.

To examine the extent of change over time in these outcomes between baseline and 18-month follow-up, we constructed hierarchical linear models (HLM) for each outcome controlling for age, gender, baseline mental distress, and histories of victimization, arrest and substance abuse treatment. None of these measures were found to predict changes in any drug use outcome, except for a very modest (1.7 additional days reduction per 6month follow-up period) effect of substance abuse treatment history on opioid use. Given the failure of these more complex models to contribute information to the main findings, we report effect sizes using the Cohen's *d* statistic, with pooled standard deviations as the denominators. The magnitude of successive changes from wave to wave for each outcome measure are reported using paired *t* tests, applying the Bonferroni correction for multiple tests ($p = .05/6 = .0083$).

To examine the effects of multiple assessments on drug use behaviors, we also constructed HLM models to examine differences in the change in the use of each drug by number of follow-up assessments completed. For each outcome, we included only those participants who used that substance at baseline, and we compared the baseline frequency of use to that reported for the most recent follow-up completed. Similarly, we constructed one-way ANOVA models to

examine the relationship between number of assessments completed and changes in each drug use outcome between baseline and the most recent non-missing follow-up values. Because the results of the HLM models did not differ from the one-way ANOVA models, we report the ANOVA results for ease of presentation and interpretation across the four drug use outcomes. Finally, we compared the retention, demographic, substance use and substance dependence characteristics of the focus group participants (described immediately below) to the rest of the sample using chi-square and *t* tests.

2.5. Qualitative data collection and analyses

Following completion of the survey study, eight focus groups, including a total of 28 participants age 29years and less, were conducted in order to better understand the patterns of substance use changes observed over the course of the study. Focus group participants were selected to achieve diversity as to gender, race/ethnicity and primary drug at study entry. Group sessions were audio-recorded and lasted about 1 hour. The interview guide included open-ended questions about: benefits and drawbacks to participation in the club scene; motivations for study enrollment; positive and negative experiences of participation; changes in drug use, sexual behaviors and/or other health and social indices over the course of the study; and reasons for any mentioned changes in behaviors and health. Participants were compensated \$50 for their participation.

Focus group sessions were transcribed using pseudonyms to identify individual speakers. The transcribed texts were segmented and coded while retaining their links to the original speakers and contexts (Miles & Huberman, 1994) using the QSR N6 (QSR International, 2006) text analysis software. The coding themes emerged from the data following a constructivist-oriented grounded theory approach (Charmaz, 2000). The number of groups was considered sufficient when the group discussions reached saturation, or converged, i.e., when additional data collection was not expected to generate new knowledge or themes (Morgan, 1997).

3. Results

3.1. Participant retention

Tracking procedures to maintain constant contact with all participants through their last assessment resulted in 6-, 12-, and 18-month follow-up rates of 79, 73 and 75%, respectively. At least one wave of follow-up data was collected from 89% of participants. Analyses showed no sample attrition bias at any wave at the .05 significance level on gender, race/ethnicity, mental health status, substance abuse treatment history, or frequency and amount of drug use at baseline.

3.2. Sample characteristics

Descriptive data from the sample at study entry are shown in Table 1. The mean age was 22.2 years, 40% were female, and the sample mirrored the ethnic diversity of Miami-Dade County. The participants reported a somewhat higher level of educational achievement than the 63.9% public school graduation rate for Miami-Dade County during the study recruitment period (Florida Department of Education, 2008). Health and social risk indices were high, with large proportions reporting severe mental distress (45.3%), unprotected sex (71.8%), sex while high or drunk (93.2%), and histories of arrest (63.5%) homelessness (24.8%), and childhood victimization (66.7%).

Ninety-six percent or more of the sample were current users of marijuana and alcohol; 89.2% powder cocaine; 85.1% ecstasy; 21.6% LSD; and 5.0% methamphetamine. Over 89% of the sample currently used benzodiazepines and over 55% opioids for non-prescribed

Table 1
Baseline demographics, health social risk measures, and substance use behaviors of young adult multidrug users $N=444$.

	<i>n</i>	%	Days use Mean (SD) ^a
Demographics			
Age (mean, SD)	22.2	(3.44)	
Female gender	178	40.0%	
Ethnicity:			
Hispanic	259	58.4%	
African American/Caribbean	92	20.7%	
White	77	17.3%	
Other	16	3.6%	
Sexual identity:			
Heterosexual	374	84.2%	
Gay/bisexual/other	70	15.8%	
Education ≥ 12 years	329	74.1%	
Ever arrested	282	63.5%	
Victimized before age 18	296	66.7%	
Ever homeless	110	24.8%	
Live with parents	226	50.9%	
Employed (part or full time)	252	56.8%	
Mental health			
Severe mental distress	201	45.3%	
Sexual behaviors (past year)			
Unprotected vaginal/anal sex	319	71.8%	
Sex while high/drank	414	93.2%	
Substance use (past 90 days)			
Alcohol	441	99.3%	43.4 (25.1)
Marijuana	428	96.4%	67.4 (29.5)
Cocaine (powder)	396	89.2%	30.2 (26.1)
Ecstasy	378	85.1%	15.8 (17.2)
LSD	96	21.6%	8.1 (13.7)
Methamphetamine	22	5.0%	10.0 (21.4)
Rx sedatives	397	89.4%	27.2 (27.2)
Rx opioids	248	55.9%	23.6 (28.3)
Agree risky drug use needs changing	206	46.4%	
Substance use treatment history	170	38.2%	
DSM-IV substance dependence	276	62.2%	

^a Data are for past 90 day users of each substance.

reasons. The most commonly reported pain killers among non-medical opioid users included hydrocodone (45.6%), OxyContin (27.8%), other oxycodone (59.3%) and codeine (23.4%). Non-medical benzodiazepine users most commonly reported using alprazolam (96.5%) and diazepam (13.6%). Less than half of the sample (46.4%) agreed with the statement, "I have risky drug using behaviors that need changing." Almost two-thirds (62.2%) met DSM-IV criteria for substance dependence.

Table 2
Changes in drug use frequencies and substance dependence symptoms by follow-up period.^{a,b}

	BL Mean (SD)	6months Mean (SD)	12 months Mean (SD)	18 months Mean (SD)	W01 Δ <i>p</i>	W12 Δ <i>p</i>	W23 Δ <i>p</i>	W03 Δ <i>p</i>	Effect size ^c
Days cocaine use (cocaine users at baseline)	30.22 (26.09) (<i>n</i> =396)	19.27 (26.47) (<i>n</i> =317)	11.79 (21.90) (<i>n</i> =289)	9.25 (19.89) (<i>n</i> =299)	.000	.000	.172	.000	-.85
Days ecstasy use (ecstasy users at baseline)	15.75 (17.16) (<i>n</i> =378)	6.80 (12.74) (<i>n</i> =302)	3.41 (8.89) (<i>n</i> =280)	2.41 (7.71) (<i>n</i> =283)	.000	.000	.032	.000	-.93
Days benzodiazepine use (benzodiazepine users at baseline)	27.22 (27.24) (<i>n</i> =397)	15.67 (24.84) (<i>n</i> =317)	10.44 (20.19) (<i>n</i> =286)	8.14 (17.46) (<i>n</i> =295)	.000	.000	.032	.000	-.82
Days opioid use (opioid users at baseline)	23.57 (28.34) (<i>n</i> =248)	9.75 (20.12) (<i>n</i> =201)	8.21 (19.45) (<i>n</i> =177)	5.17 (13.95) (<i>n</i> =190)	.000	.067	.028	.000	-.81
Subst. depend. symptoms (full sample)	3.45 (2.13) (<i>n</i> =444)	3.34 (2.18) (<i>n</i> =352)	2.83 (2.24) (<i>n</i> =325)	2.54 (2.30) (<i>n</i> =333)	.261	.000	.001	.000	-.42

^a Table notation: BL=baseline; W01 Δ =change from BL to 6 months (wave 1); W12 Δ =change from 6 months (wave 1) to 12 months (wave 2); W23 Δ =change from 12 months (wave 2) to 18 months (wave 3); W03 Δ =change from BL to 18 months (wave 3).

^b Paired *t*-test comparisons between waves; statistical significance with Bonferroni correction=.0083.

^c Effect size=Cohen's *d* statistic (pooled variance).

3.3. Longitudinal analyses

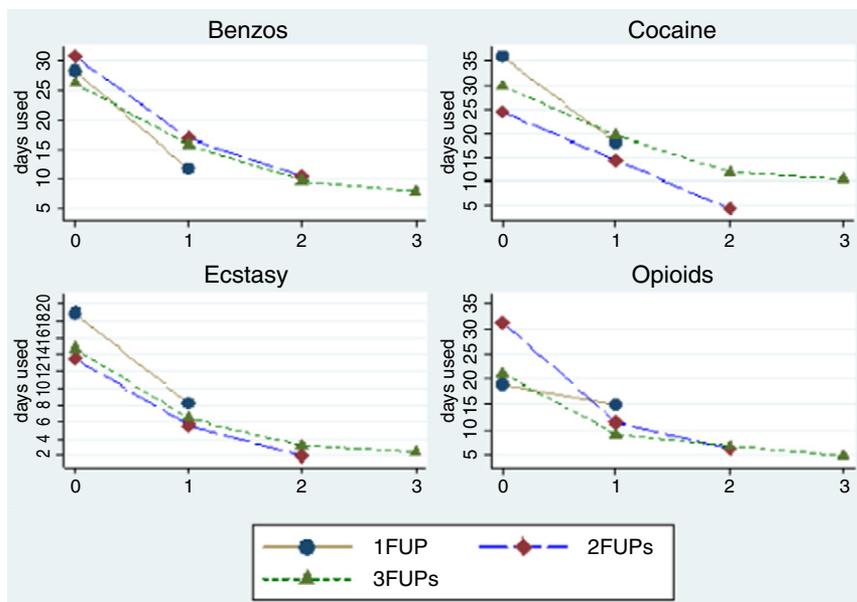
Table 2 reports changes in five outcome measures—days cocaine, ecstasy, benzodiazepine and opioid use and substance dependence symptoms—over the course of the study. First, the means, standard deviations, and included sample sizes are shown for each measure at each wave, as well as the associated significance tests for the change in each measure over the course of each follow-up period. The basic pattern for all measures was that the largest reductions in substance use frequencies occurred between baseline and the first follow-up, with smaller reductions between the 6- and 12-month follow-up, and smaller to non-significant changes between 12 and 18 months. The exception to the pattern was that the reduction in opioid use was also non-significant from the 6- to the 12-month follow-up. Reductions in substance dependence symptoms were non-significant in the baseline to the 6-month period, but significant for each wave thereafter.

The aggregate changes for these outcome measures between baseline and 18 months were: a 69.4% reduction in days' cocaine use; 84.7% in days' ecstasy use, 70.1% in days' benzodiazepine use; 78.1% in days' opioid use, and a 26.4% reduction in substance dependence symptoms. Associated effect sizes (Cohen's *d*: mean differences divided by the pooled standard deviations) for each measure are also shown in Table 2.

Fig. 1 shows the results of one-way ANOVA tests to examine whether the extent of change in each drug use outcome was related to the number of assessments completed. For the 397 participants who reported benzodiazepine use at baseline, 245 completed all three follow-up assessments, 56 completed two follow-ups, 51 completed one follow-up and 45 completed only the baseline assessment. The ANOVA test showed no differences in reduction of days benzodiazepine use by number of follow-ups completed ($F=0.14$, $df=2$, $p=.873$). Similar tests examining changes in cocaine ($F=0.20$, $df=2$, $p=.817$) and ecstasy ($F=0.80$, $df=2$, $p=.452$) use also showed no differences by number of assessments completed. A higher number of completed assessments did predict greater reductions in the use of prescription opioids, however ($F=7.22$, $df=2$, $p=.001$).

3.4. Qualitative research with study completers

Focus group participants were selected from those who completed their 18-month assessment, to avoid any potential effects on their drug use behaviors while they were enrolled. Table 3 compares retention, demographic, substance use and substance dependence characteristics of the focus group participants to the rest of the sample. No significant differences were found between focus group



¹ Change is measured from baseline to the last follow-up completed for all users of the mentioned drug at baseline.

² One-way ANOVA test for differences in change from baseline, conditional on number of assessments completed:

Benzodiazepines (N=397): F=0.14; df=2; p=0.873.

Cocaine (N=396): F=0.20; df=2; p=0.817.

Ecstasy (N=378): F=0.80; df=2; p=0.452.

Opioids (N=248): F=7.22; df=2; p=0.001.

Fig. 1. Changes in past 90day drug use by number of follow-ups (FUP) completed¹⁻².

participants and non-participants on measures of demographics, baseline or 18-month drug use, or baseline or 18-month follow-up substance dependence symptoms. Focus group participants completed, on average, more follow-up assessments (mean = 2.89) than non-participants (mean = 2.23; $t = -3.252$; $p = .001$).

The focus groups identified a number of important themes related to participants' unexpected behavioral changes. Participants almost universally reported that they were not contemplating change at study entry, and that they were initially motivated to participate because of the monetary incentives, their interest in research, or simple curiosity. In fact, several participants specifically indicated that they would have been unlikely to participate had the study been

framed as an intervention or assistance program, because they were generally unaware of problematic aspects of their drug use at the time of enrollment.

Along these same lines, a particularly prevalent theme emerged during the focus groups centering on the interview experience as a tool for self-reflection. Nearly 70% of the focus group participants reported that it was the act of calculating and expressing answers to the assessment items that "turned on a light" for them. This growing awareness tended to be focused in two primary areas: recognition of the amount of drug use that a participant had engaged in over time; and, connecting drug use with health or social problems. As one 21 year old Hispanic participant stated:

Table 3

Characteristics of focus group participants ($n=28$) vs. the rest of the sample ($n=416$).

	FG participants		Non-participants		Chi-square	p
	n / % or mean (SD)		n / % or mean (SD)		or t-statistic	
Demographics						
Age	22.9	(3.47)	21.9	(3.43)	-1.485	.138
Male	15	53.6%	251	60.6%	0.545	.460
Ethnicity:						
Hispanic	17	60.7%	258	62.0%	0.019	.891
African American/Caribbean	7	25.0%	85	20.4%	0.333	.564
White	5	17.9%	72	17.3%	0.006	.941
Education in years	12.2	(1.48)	12.2	(1.83)	0.128	.898
Substance use (days in past 90days)						
Benzodiazepine at baseline	25.71	(28.80)	27.30	(27.19)	0.259	.795
Benzodiazepine at wave 3	13.43	(18.72)	7.73	(17.33)	-1.444	.150
Cocaine at baseline	37.12	(31.65)	29.76	(25.66)	-1.367	.172
Cocaine at wave 3	15.12	(22.98)	8.72	(19.54)	-1.545	.123
Substance dependence symptoms at baseline	2.93	(2.16)	3.49	(3.07)	1.354	.177
Substance dependence symptoms at wave 3	2.04	(2.17)	1.61	(3.02)	-1.078	.282
Number of waves completed	2.89	(0.42)	2.23	(1.07)	-3.252	.001

When you start getting numbers down, like 'I've done this many pills,' and then after you start thinking like how much money you've spent, and like in the end... 'I've gotten into pretty big trouble.'"

A 21 year old white female expressed a strikingly similar effect of the assessment:

"And you're like, 'why is this number so big?' You think about it rationally laying in bed or something. It never occurs to you just how big of a number it is, and then you look at it like 'wow, that's me.'"

A 24 year old African American woman described the assessment as a tool to help people "think about their drug use and where they are in their life now. And it gets the ball rolling in your head."

Specific areas of insight into life problems and their association with drug use were mentioned by several participants as motivations for change, and these tended to include family and relationship problems, employment and school responsibilities and goals, legal issues, money issues, and the lack of supportive social networks. In this regard, many of these young people expressed a general dissatisfaction with the "superficial" relationships they were able to form within the club scene, and reported general feelings of isolation and lack of communication with others.

Taken together, these indicators suggest that the interview assessments played a key role in risk reduction over time. The intervention effects of the assessments were attributed by completers to: (1) the friendly, non-judgmental field staff of same-age peers; (2) the thorough and detailed assessments, particularly those items related to HIV risk knowledge and behaviors, lifetime and current substance use quantities, social ties and economic status, and mental health symptoms; and, (3) an emerging self-awareness of substance use-related problems based on their responses to the assessment items.

It should be noted that behavior change was described repeatedly as an individual decision, and focus group participants generally agreed that each person needs to come to the conclusion about change for themselves. As one 20 year old Latina said, "If you would tell me 'You have a problem' and stuff, I used to laugh in your face and I didn't care." Many expressed the need to "figure it out on my own", and explicitly objected to self-help groups, feeling that this approach would not work for them.

4. Discussion

4.1. Limitations

Several limitations of the study design must be considered in evaluating the findings. First, the results are not necessarily generalizable to the overall population of men and women in the club scene in Miami because of the eligibility requirements requiring regular, recent use of both club and prescription drugs. The sample's somewhat unbalanced gender ratio (39.9% women) is likely attributable to fewer women meeting the drug use frequency requirements than men, not because there are fewer women than men in the club culture. It is also likely that financially well-off men and women were less inclined to participate than those of middle and lower incomes for whom the stipends were a significant incentive.

The data presented rely on self-report, and some respondents may have refrained from reporting the full extent of socially undesirable behaviors. Given the high levels of substance use and sexual risk behaviors reported by participants in the study, however, under-reporting of these and other stigmatized behaviors would appear to be uncommon. It must also be emphasized that the study was not a randomized controlled trial, and lacked a comparison or control group that would enable us to clearly identify the role of the assessments in causing the observed behavioral changes. Thus, maturation and other

potential influences on changes in drug use behavior over time cannot be entirely ruled out.

4.2. Intervention-like effects of the assessments

A body of recent research has documented that club drug use remains widespread and problematic among young adult populations (Leung & Cottler, 2008; Parsons, Grov, & Kelly, 2009; Ramo, Grove, Delucchi, Kelly, & Parsons, 2010), and the findings of the present study offer clear support for this observation. Baseline data from this large sample of young club and prescription drug users demonstrate substantial and problematic levels of multidrug use to get high or to moderate the effects of other drugs. Despite the trendy, hip, high-style reputation of Miami's nightclub scene, many participants reported victimization, mental distress, drug dependence symptoms, and criminal justice involvement. In addition, sexual risks for HIV infection, including unprotected sex and being drunk or high during sex, were prevalent among the sample. Despite this high risk behavioral profile, club drug users have generally not been targeted by HIV prevention initiatives. As a result, available interventions to reduce sexual risks and substance use are limited for young men and women in the club scene, as they are largely disconnected from clinical care settings and tend to resist prevention messages from parental and governmental sources.

Nevertheless, this study documented large effect sizes (Cohen, 1988) for reductions over 18 months in the use of each of the prevalent club and prescription drugs. Moreover, substance dependence symptoms were reduced from *DSM-IV* clinical significance at baseline to symptom levels below the established clinical threshold at 18-month follow-up. Although the observed behavioral changes were unanticipated within the context of this natural history study, the effects are consistent with the literature on reactive measurement effects. Reactive effects of research and/or clinical assessments among substance users have been recognized in the literature since at least the mid-1970s (Clifford & Maisto, 2000). Researchers studying both substance use and sexual risk behaviors have noted behavioral responses to assessments, and have attributed them to consciousness raising, focused attention, self-monitoring, increased self-awareness, self-efficacy, and similar phenomena (Clifford & Maisto, 2000; Epstein, et al., 2005; Halkitis, et al., 2007; Lightfoot, et al., 2007; Marsden, et al., 2006). One recent study (Clifford, Maisto, & Davis, 2007) noted the similarities between comprehensive research assessments and substance abuse treatment, e.g., problem assessment and perceived professional interest in one's well-being.

The findings of the present study, combined with the insights gained from the focus group sessions, would indicate that for this sample of young adult club drug users, reactive effects to the lengthy and detailed study assessments were significant contributors to the observed patterns of behavioral change over time. Moreover, the most significant reductions in drug use occurred after a single assessment, and the completion of more than one follow-up assessment was not associated with greater reductions in use except for a modest reinforcing effect on reductions in prescription opioid use. The implications of these findings are highly significant, particularly when considered in light of club drug users' general resistance to intervention messages. Our results suggest that comprehensive health and behavioral assessments may offer an acceptable, efficacious, and low-cost intervention strategy for this population.

5. Conclusion

The data presented in this paper make a compelling case that the study assessment interviews served as risk reduction tools by increasing participants' self-awareness and self-monitoring. It must be emphasized, however, that the study described in this report was not a randomized controlled trial, and therefore lacked key design

elements, including a comparison or control group, that would produce more conclusive evidence regarding the impact of exposure to the study assessments. This design issue hampers our ability to definitively rule out competing explanations for the observed behavioral changes, including possible effects related to aging or maturing out of the scene, or experience of other life events. We fielded a new study to examine these questions in a randomized clinical trial design in 2011. Nevertheless, our focus group data strongly suggest that reactive assessment effects were identifiable and highly salient to this population of young adult club drug users.

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