Comparing and contrasting the effectiveness of time-space sampling methods to identify club-drug-using emerging adults

Christian Grov, Ph.D. MPH [1,2,3]

Jeffrey T. Parsons Ph.D. [1,4], & Brian C. Kelly, Ph.D. [1,5]

[1] Center for HIV Educational Studies and Training (CHEST)
[2] National Development and Research Institutes, Inc. (NDRI)
[3] Medical and Health Research Association, Inc. (MHRA)
[4] Hunter College
[5] Purdue University

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Research in applied settings

- The Club Drugs and Health Project (The PARTY Project)
  - Enroll 400 club-going drug-using young adults (18-29)
  - Stratified by gender & sexual orientation
  - TSS used to Recruit for this larger study
- Tested two variations of TSS
  - sample variability
  - Response rate/feasibility

Club Drugs

- Ketamine, MDMA/ecstasy, GHB, Cocaine, Methamphetamine, LSD/acid
- Linked specifically to “club culture”
- Often limited to conveniences samples
  - Or devoid of club-cultural characteristics (e.g., NSDUH or Monitoring the Future)

Time Space sampling

- Pioneered by the CDC
- Urban health research
- Location-based populations (museums, polling, clubs/bars)
- Hard-to-reach populations
- Probability-based method
  - A random sample!!!

Time Space sampling

- Multi-level randomization
  - Time (day of week, time of day)
  - Space/Venue
  - ?? Individuals within venues ???
- Can be costly
  - Population may not always gather at the times or spaces you want
  - Staff: Counter & Screeners
    - 700 people →100 approached → 58 consent → 6 eligible → 2 interested

Counting and TSS

- Mackellar and colleagues (2006, 2007) "counted" all participants who crossed an imaginary line/threshold
- Muhib et al. (2001) "systematically" approached those who crossed such a pre-defined threshold"
- Fernandez et al. (2005, 2007) specified having approached every n^{th} person

Why Count the individual?

- Already randomized time and space
- Counting requires extra staff & time
- Will not randomizing individuals bias the sample ???
  - Interviewers will only approach people who they "want" to, or feel comfortable approaching, versus "having" to approach on a random basis
  - Our data suggest, randomization at the individual level may not be necessary

TSS version 1

- Tri-level randomization
  - (1) Day (2)venue (3) n^{th} person
- December 2004–July 2005
- Thursday – Sunday: NYC Bars & Night Clubs
- Data collected on Palm Pilots
- Administered by recruitment staff (teams of 3)
- 2 to 4 minute survey

TSS version 2

- Bi-level randomization
  - (1) Day and (2) Venue
- July 2005 – December 2006
- Teams of 2 staff members
- Identical procedure otherwise

Measures

- Gender
- Sexual Orientation (straight v. not)
- Race & ethnicity
- Ever Used a Drug?
  - K, MDMA, GHB, Coke, Meth, LSD
    - Days of Use in Last year?
      - (3+ days) → Asked if used in last 3 months?

Results

- Only data from 18–29yo analyzed
- 18,169 approaches conducted
  - $n_{\text{Version 1}} = 4{,}135$, $n_{\text{Version 2}} = 14{,}034$
- 10,678 (58.8%) consented
  - V1 response rate = 46.0% (n = 1,904 of 4,135)
  - V2 response rate = 62.5% (n = 8,774 of 14,034)

Gender and Sexual Orientation

- 1,614 gay/bisexual men
- 1,781 lesbian/bisexual women
- 3,439 heterosexual men
- 3,781 heterosexual women

- All analyses conducted within sexual orientation
  - (e.g., gay/bi men from V1 versus gay/bi men from V2)
- *p* value raised to .01

Table 1. *Comparing substance use and demographic characteristics from two versions of time-space sampling*

	Gay and Bisexual Men			Lesbian and Bisexual Women			Heterosexual Men			Heterosexual Women		
	Version 1 [a] n = 562	Version 2 [b] n = 1052	t (1612)	Version 1 [a] n = 385	Version 2 [b] n = 1396	t (1779)	Version 1 [a] n = 449	Version 2 [b] n = 2990	t (3437)	Version 1 [a] n = 495	Version 2 [b] n = 3286	t (3779)
Mean Age	24.2	23.8	-2.64 **	24.3	24.1	-1.33	24.3	23.9	-3.32 ***	23.3	23.2	-0.43
			χ^2(1)			χ^2(1)			χ^2(1)			χ^2(1)
Ever tried a drug	65.7%	69.6%	2.60	75.8%	81.2%	5.33 *	73.5%	71.6%	0.67	67.7%	60.2%	10.06 ***
Among those having tried a drug			χ^2(1)			χ^2(1)			χ^2(1)			χ^2(1)
. . . MDMA/Ecstasy	71.0	68.2	0.89	64.7	63.2	0.24	63.3	59.6	1.61	55.4	50.9	2.31
. . . Ketamine	37.3	34.5	0.80	25.4	24.8	0.06	33.2	24.9	10.23 ***	20.4	15.8	4.42 *
. . . Cocaine	65.0	67.2	0.51	57.9	59.2	0.15	56.9	52.5	2.17	50.3	44.3	4.14 *
. . . GHB	22.5	19.6	1.19	11.7	12.2	0.05	15.9	11.6	4.82 *	10.5	7.7	2.90
. . . Methamphetamine	32.1	27.8	2.08	20.3	18.8	0.33	17.5	14.2	2.39	14.3	8.7	10.42 **
. . . LSD/Acid	31.0	35.4	2.01	40.0	38.1	0.37	43.7	35.1	9.16 **	30.2	23.8	6.25 *
Race and Ethnicity			χ^2(5)			χ^2(5)			χ^2(5)			χ^2(5)
Asian	6.5	5.6	4.94	2.1	5.4	7.49	9.4	8.0	10.77	7.5	8.7	4.48
African American	9.5	9.2		9.6	7.9		4.0	5.8		4.2	5.6	
Latino(a)	18.4	14.8		14.4	14.0		10.0	12.4		12.8	12.2	
Mixed	6.5	7.0		7.2	7.1		4.6	4.2		5.7	3.8	
Other	3.0	4.9		4.8	6.4		9.1	5.4		3.3	4.0	
Caucasian	56.1	58.6		62.0	59.2		62.9	64.3		66.6	65.6	
Race and Ethnicity, dichotomous			χ^2(1)			χ^2(1)			χ^2(1)			χ^2(1)
Caucasian	56.1	58.6	0.63	62.0	59.2	0.74	62.9	64.3	0.24	66.6	65.6	0.12
non-Caucasian	43.9	41.4		38.0	40.8		37.1	35.7		33.4	34.4	

[a] Randomized venue, time, and individual (Dec. 2004 - Aug. 2005), N = 1904

[b] Randomized venue and time (Aug. 2005 - Dec. 2006), N = 8774

* p < .05, ** p < .01, *** p < .001

Differences from V1 to V2

- Men in v2 slightly younger (0.4 years)
  - No differences among women
- No racial or ethnic differences from V1 to V2

  - → within each sexual orientation

Differences: *Ever* used a Drug

- Heterosexual women
  - V1 67.7% ever used drug
  - V2 60.2% ever used drug

- No differences in lifetime drug use for
  - Gay/bi men
  - Lesbian/bi women
  - Heterosexual men

Differences: Club Drug Use

- Among those having used a drug. . .
  - No differences
    - gay/bi men
    - lesbian/bi women
  - Heterosexual men
    - Ketamine 33.2% v. 24.9%
    - LSD 43.7% v. 35.1%
  - Heterosexual women
    - Meth 14.3% v. 8.7%

Frequency of use (Table 2)

- **Among club drug users . . .**
  - No differences
    - Gay/bi men
    - Lesbian/bi women
    - Heterosexual men

- Heterosexual women
  - No use last year 52.4% v. 58.1%

Table 2. *Comparing substance use characteristics and, among frequent drug users, demographic characteristics from two versions of time-space sampling*

	Gay and Bisexual Men			Lesbian and Bisexual Women			Heterosexual Men			Heterosexual Women		
	Version 1 [a]	Version 2 [b]	χ^2 (2)	Version 1 [a]	Version 2 [b]	χ^2 (2)	Version 1 [a]	Version 2 [b]	χ^2 (2)	Version 1 [a]	Version 2 [b]	χ^2 (2)
Among those having ever tried a drug one of the six [c] club drugs	n = 369	n = 732		n = 292	n = 1133		n = 330	n = 2142		n = 335	n = 1979	
. . . Not used in the last year	35.3%	33.3%	0.47	46.2%	48.7%	0.80	42.5%	47.4%	2.88	52.4%	58.1%	8.88 **
. . . Used 1 - 2 times in the last year	15.4	16.4		14.0	14.3		16.0	15.6		11.4	13.8	
. . . Used 3+ time in the last year	49.3	50.3		39.8	36.9		41.5	36.9		36.3	28.1	
. . . Among those who used 3+ times in the last year	n = 179	n = 361	χ^2 (1)	n = 111	n = 412	χ^2 (1)	n = 127	n = 770	χ^2 (1)	n = 115	n = 538	χ^2 (1)
. . . Percent having used in the last three months	78.2%	79.7%	0.17	80.2%	79.1%	0.07	81.1%	73.0%	3.76 *	75.4%	71.0%	0.92
. . . Among those who have used in the last three months	n = 140	n = 287	t (425)	n = 89	n = 325	t (412)	n = 103	n = 556	t (657)	n = 86	n = 379	t (463)
Mean Age	24.6	23.8	-2.62 **	24.2	23.7	-1.19	25.0	23.7	-3.92 ***	23.8	23.3	-1.44
Race and Ethnicity			χ^2 (5)			χ^2 (5)			χ^2 (5)			χ^2 (5)
Asian	7.1%	6.3%	13.94 **	2.2%	8.0%	N/A	5.8%	5.2%	N/A	5.8%	6.6%	N/A
African American	9.3	7.7		11.2	4.3		1.9	5.0		3.5	1.6	
Latino(a)	25.7	15.7		14.6	10.5		7.8	13.7		14.0	12.7	
Mixed	5.7	6.6		10.1	9.5		4.9	5.2		9.3	3.7	
Other	0.0	5.6		3.4	6.2		10.7	5.0		4.7	3.2	
Caucasian	52.1	58.2		58.4	61.5		68.9	65.8		62.8	72.3	
Race and Ethnicity, dichotomous			χ^2 (1)			χ^2 (1)			χ^2 (1)			χ^2 (1)
Caucasian	52.1	58.2	1.40	58.4	61.5	0.28	68.9	65.8	0.38	62.8	72.3	3.05
non-Caucasian	47.9	41.8		41.6	38.5		31.1	34.2		37.2	27.7	

[a] Randomized venue, time, and individual (Dec. 2004 - Aug. 2005), N = 1904

[b] Randomized venue and time (Aug. 2005 - Dec. 2006), N = 8774

[c] Ketamine, MDMA/Ecstasy, GHB, Cocaine, Methamphetamine, LSD/Acid

N/A = χ^2 not computed as expected cell counts fell below 5 for one or more cells

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Racial/Ethnic differences: *frequent club drug users*

- Among those reporting 3+ times club drug use, with at least once in the last 3 months

- Caucasian to person-of-color ratio
  - remained the same (*within all 4 groups*).

Discussion

- Researchers have questioned the viability of time-space sampling as a cost-effective method

- Eliminate 3rd tier of randomization?
  - Improve response rate
  - Better use of staff time (no counter, no counting, only screening)

Will this bias the sample?
  - Minimal impact, in this study.

Why the differences?

- Selecting an individual from a group, versus screening a group.
  - "I don't want to screen. My friends have left me"
  - versus "Can my friends hear my responses?"

- Drug use is more common among GLB
  - Norms create comfort?

- Variation in interviewers?
- Variation in venues ($n = 223$)

Implications

- Drug use was ubiquitous
  - Cocaine and MDMA among the highest
- Field screening can detect drug-users
  - Develop/deliver health interventions in the field?
  - Detect binge drinking?
- Important to monitor screening method

Further consideration?

- Is TSS better than other methods?
  - Respondent driven sampling
  - Targeted sampling
- Limited to bars/clubs in NYC

Thank You

Christian Grov, Ph.D. MPH
cgrov@chestnyc.org