Research Society on Alcoholism
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NCANDA: Characterization of the Sample

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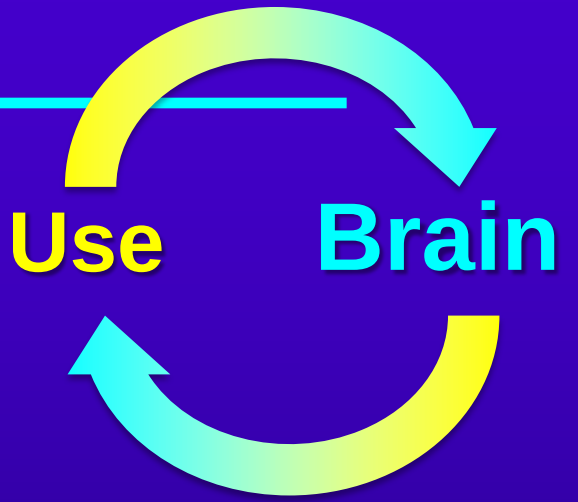
NCANDA Overview

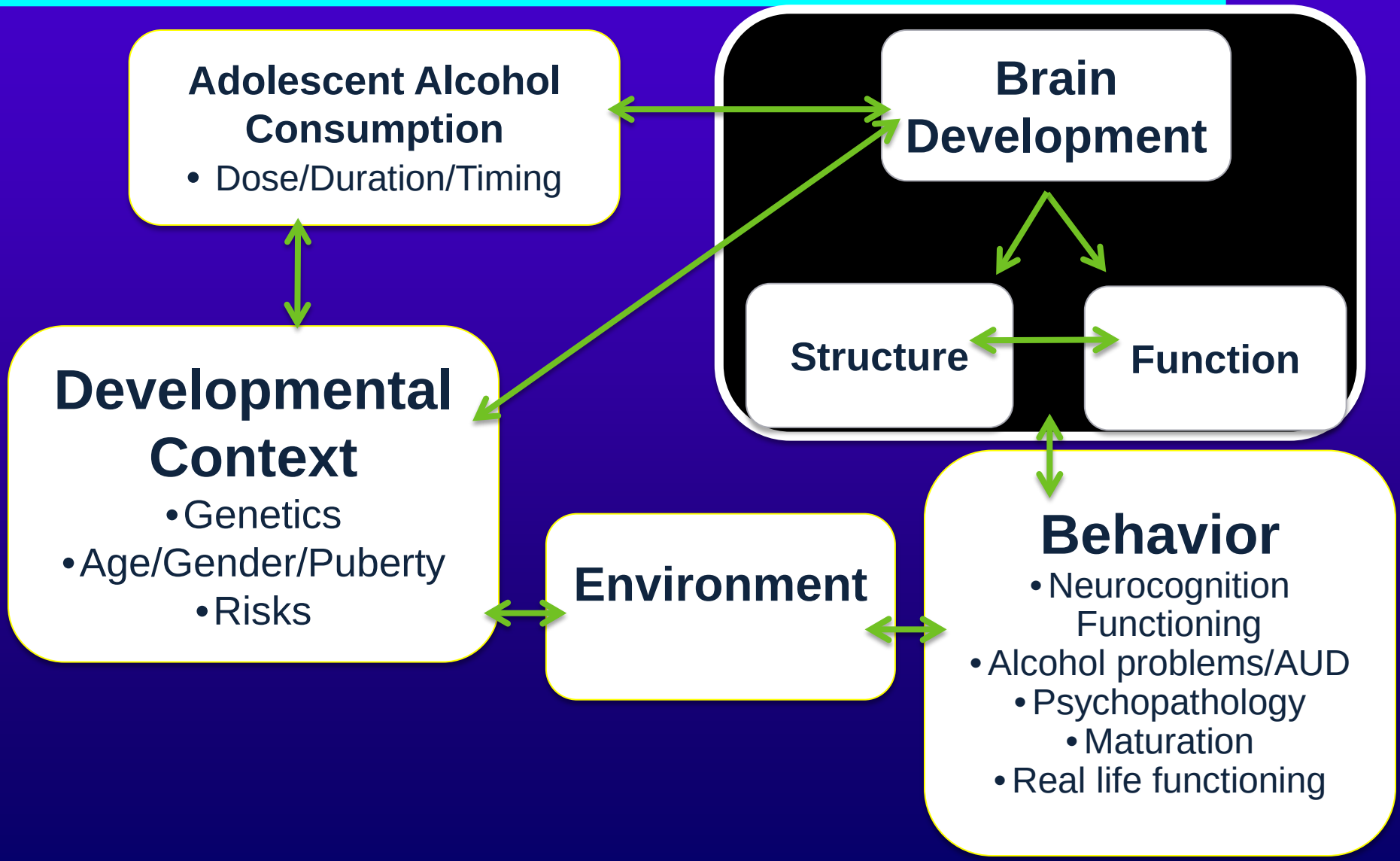
- Aims
- Recruitment
- Protocol
- Sample characteristics
- Next directions

Background



- Adolescence:
  - Neuromaturation
  - Escalations in substance use
- Deleterious effects of heavy drinking on adolescent neuromaturation suggested
  - Cross-sectional analyses
  - Smaller longitudinal studies
- Verify in large, representative sample

NCANDA Conceptual Model



NCANDA Aims

1. Drinking → adolescent neurodevelopment
2. Effects of dose, duration, and age of drinking
3. Resolution of effects with abstinence
4. Modulating factors:
   - Pubertal stage
   - Sleep
   - Sex
   - Psychopathology
   - Family history of alcoholism
5. Brain features → addiction & psychopathology

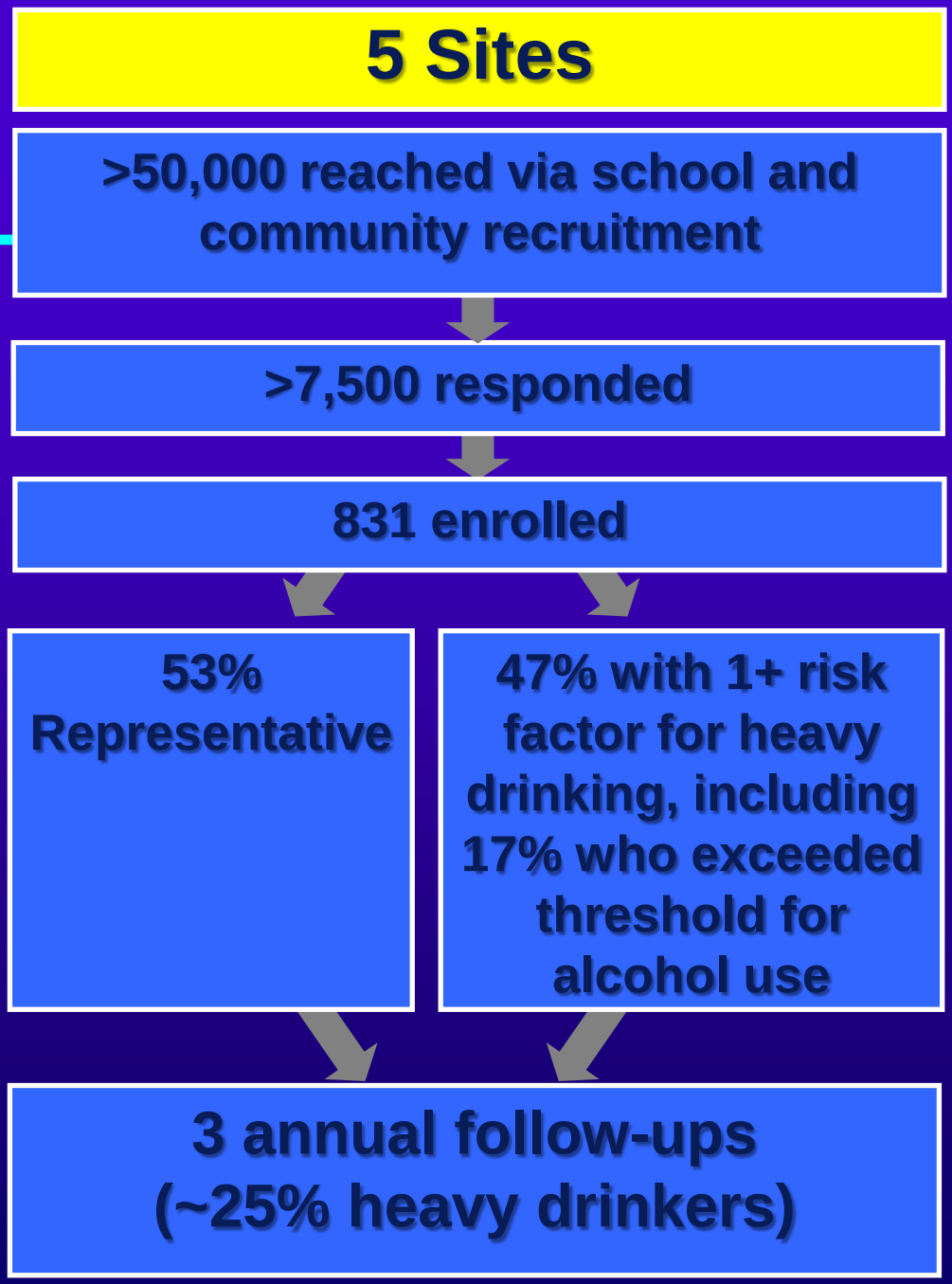
NCANDA Design

Administration:
- Sandy Brown – Coordinator
- Susan Tapert – Scientific Director

Data:
- Dolf Pfefferbaum
- Kilian Pohl
- Edie Sullivan

Sites:
- U Pittsburgh – Duncan Clark
- SRI – Ian Colrain & Fiona Baker
- Duke Univ – Michael DeBellis
- OHSU – Bonnie Nagel
- UCSD – Susan Tapert

Scientific Advisors:
- Ken Sher
- Raquel Gur
- Andrea Hussong
- Arpana Argrawal
- Bob Zucker



Exclusions at Project Entry

- Not age 12.0 - 21.9 years
- No parental consent
- Factors that preclude valid participation
- Early developmental problems
- Major psychiatric disorder
- Medications
- Serious medical problem
- Excessive substance use

Substance Use Criteria

For classification as Non/Low Drinker:

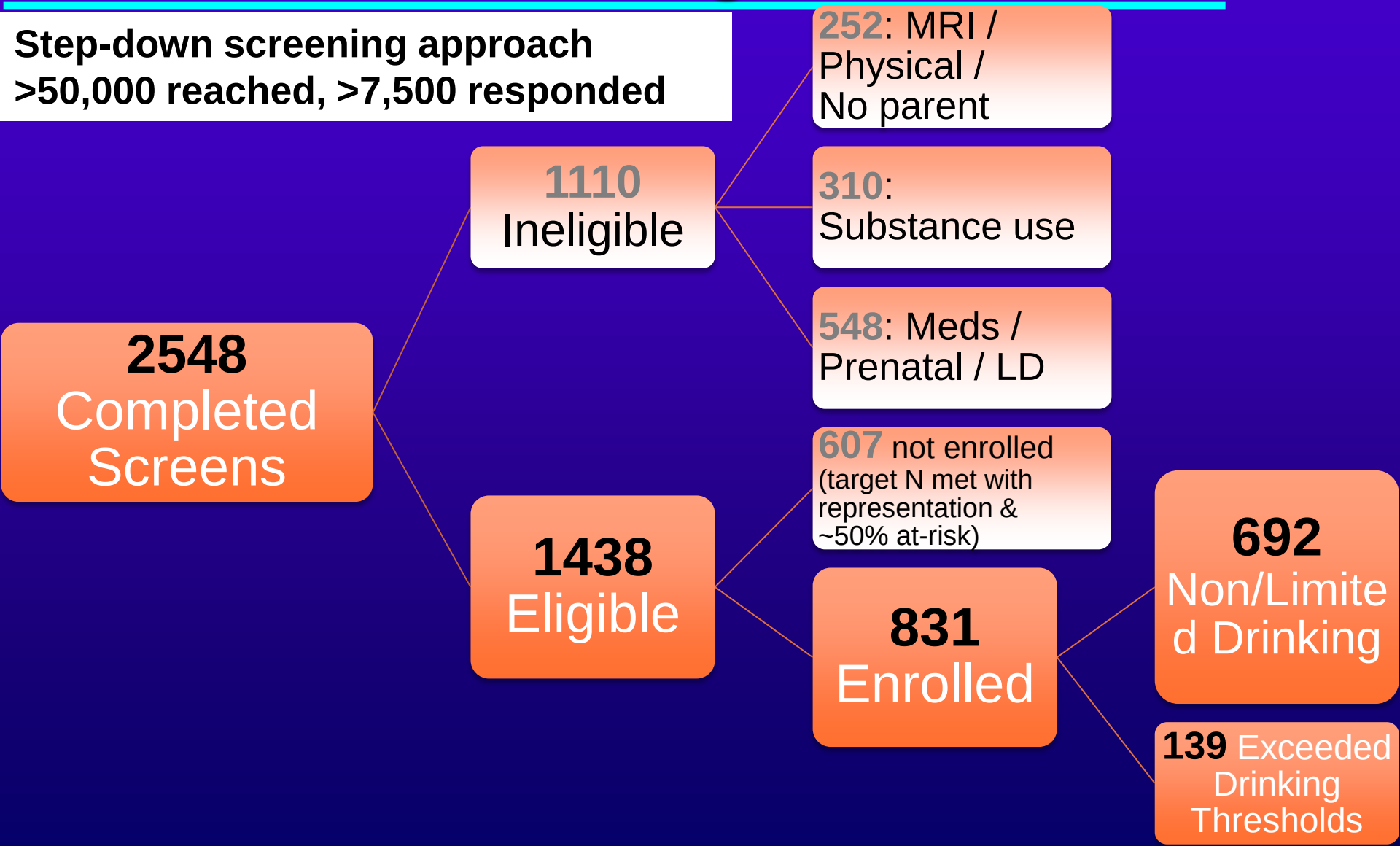
Age	Lifetime Days Drinking [a]	Maximum Drinks on One Occasion [a]		Lifetime Days Cigarette Use [b]	Lifetime Days Marijuana Use [b]	Lifetime Other Drug Use [b]
		Male	Female			
12-12.9	≤5	≤3	≤3	≤10	≤5	≤1
13-13.9	≤5	≤3	≤3	≤10	≤10	≤2
14-14.9	≤5	≤4	≤3	≤20	≤15	≤3
15-15.9	≤5	≤4	≤3	≤30	≤20	≤4
16-16.9	≤11	≤4	≤3	≤40	≤25	≤5
17-17.9	≤23	≤4	≤3	≤50	≤30	≤6
18-18.9	≤51	≤4	≤3	≤60	≤35	≤7
19-19.9	≤51	≤4	≤3	≤70	≤40	≤8
20-20.9	≤51	≤5	≤3	≤80	≤45	≤9
21-21.9	≤51	≤5	≤3	≤90	≤50	≤10

[a] NIAAA, 2008

[b] SAMHSA, 2013

NCANDA Screening

Step-down screening approach
>50,000 reached, >7,500 responded



Modified Accelerated Longitudinal Design

- Samples subjects from range of ages
- Oversampled age 12-15
- Allowed ~15% to exceed drinking thresholds
  - Mostly 18-21
  - Can estimate trajectories representing continuum from non-drinking to heavy drinking
  - Accelerated time scale

Duncan et al., 1996; Duncan et al., 2006; Miyazaki & Raudenbush, 2000

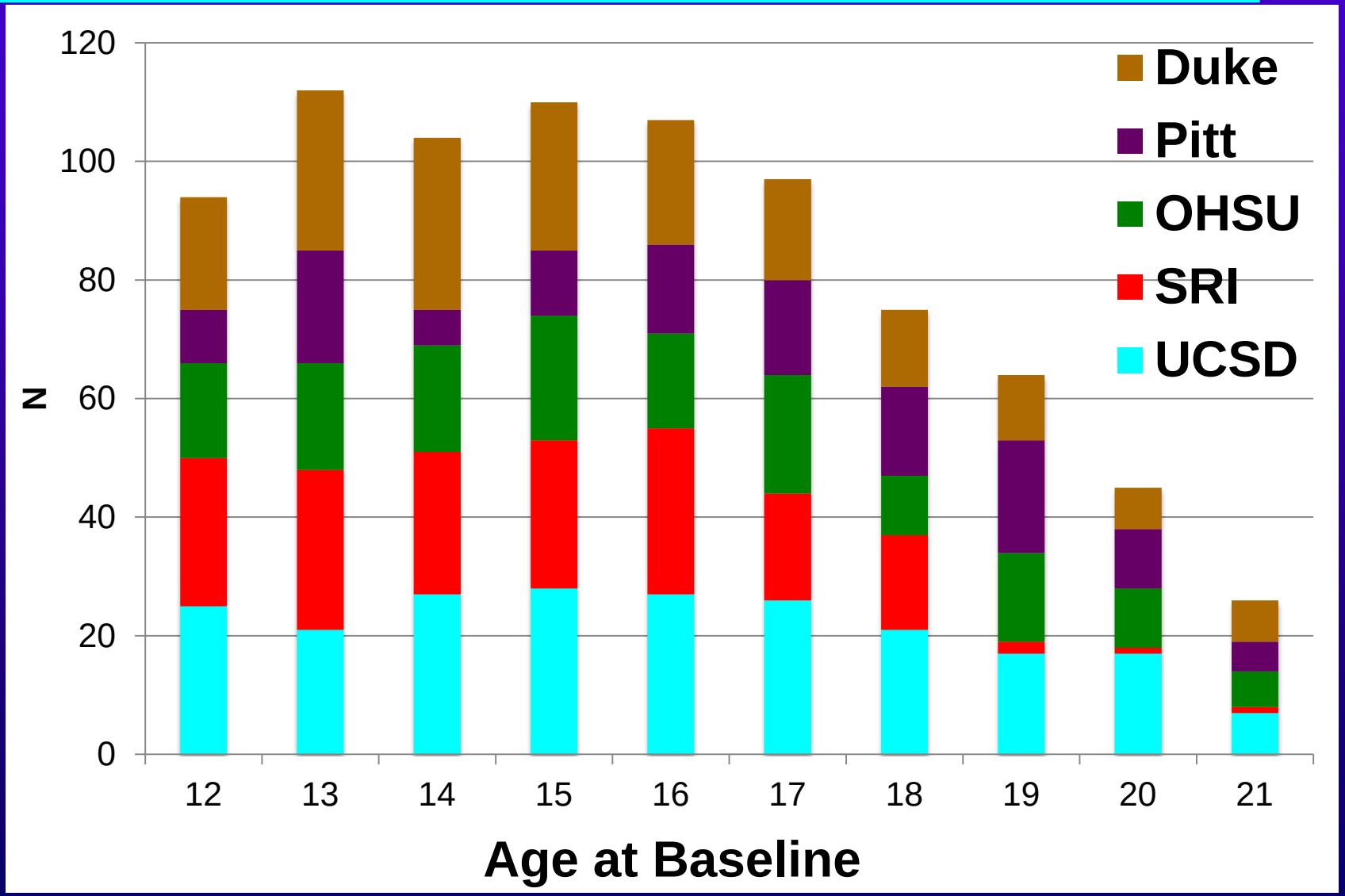
Other Data Collected:

All Sites	MRI: T1, T2, DTI, & resting state fMRI
	Neuropsychological assessment
	Samples for genetic and epigenetic analyses, pubertal hormones, and drug screening
Specialty Projects at 2 Sites	Sleep studies – SRI & Pittsburg
	Stroop fMRI task – SRI & UCSD
	Anti-saccade fMRI task – Duke & Pittsburg
	Recovery protocol – UCSD & Duke

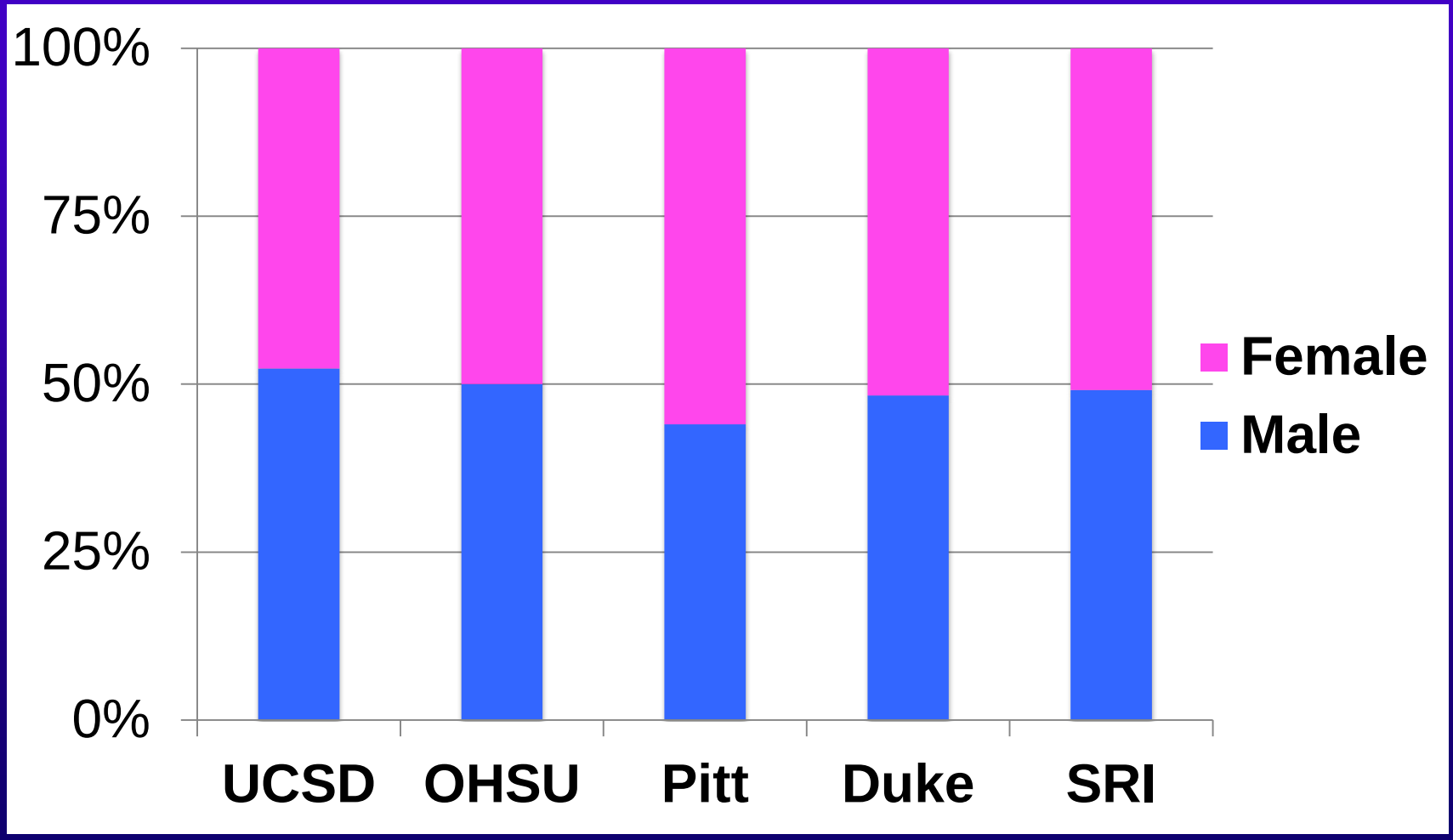
Staff Training & QA

- Senior staff at each site
- Training process:
  1. Readings and observation
  2. Repeat mock sessions observed by senior staff with feedback
  3. Mock session approved by senior-level staff member
  4. Observed assessment with real subjects
- QA:
  - Annual calibration at each site
  - Check for interviewer drift and confirm training of new staff
- Additional in-person and Skype training and reliability checks
  - Dr. Schuckit provided video-recorded training on SSAGA
- Manuals: clinical, neuropsych, MRI, and data management

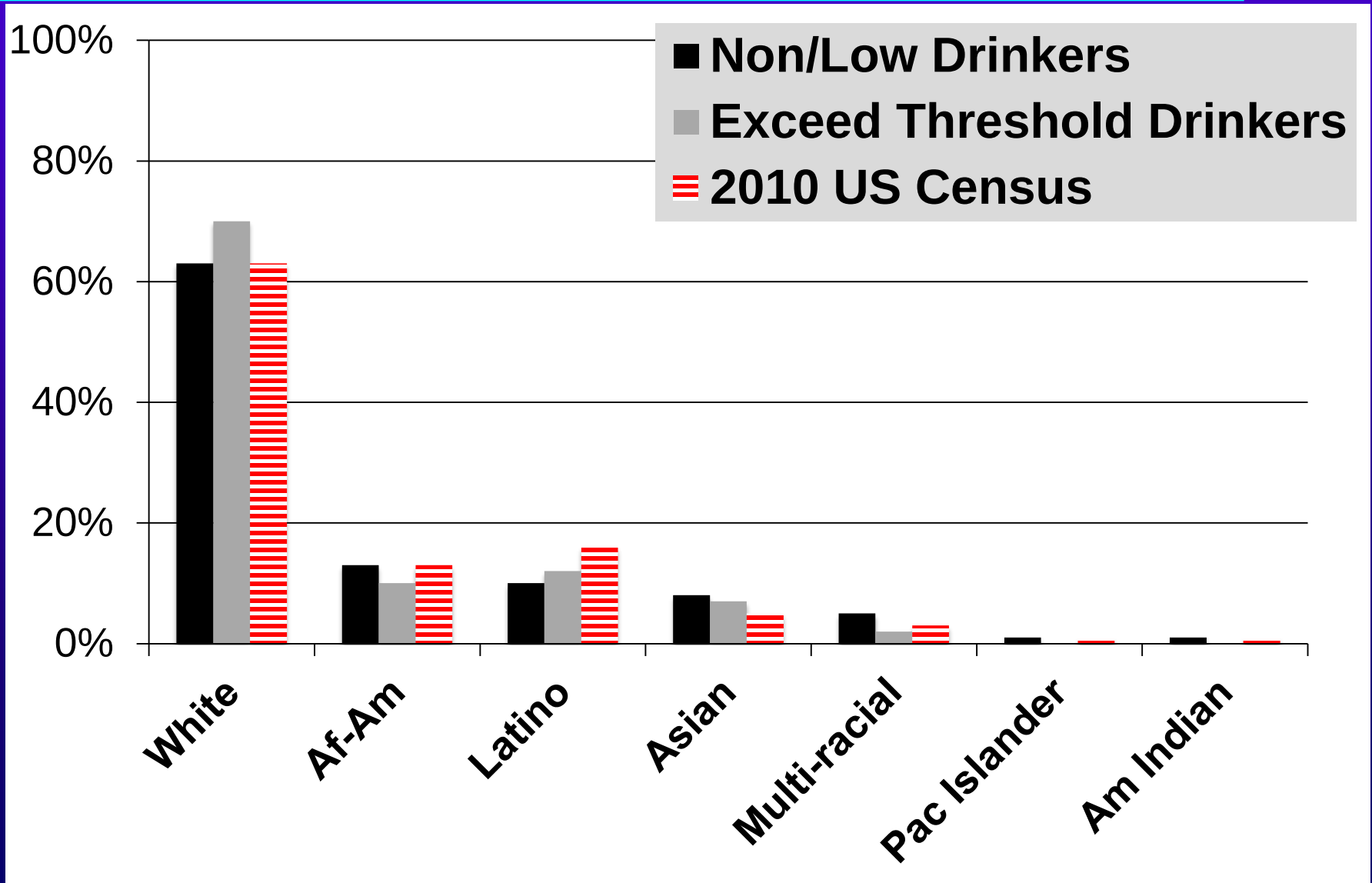
NCANDA Sample: Age Distribution



Balanced Female : Male Ratio



Ethnicity: Nationally Representative



Sample Characteristics

N = 831, age = 12-21 years

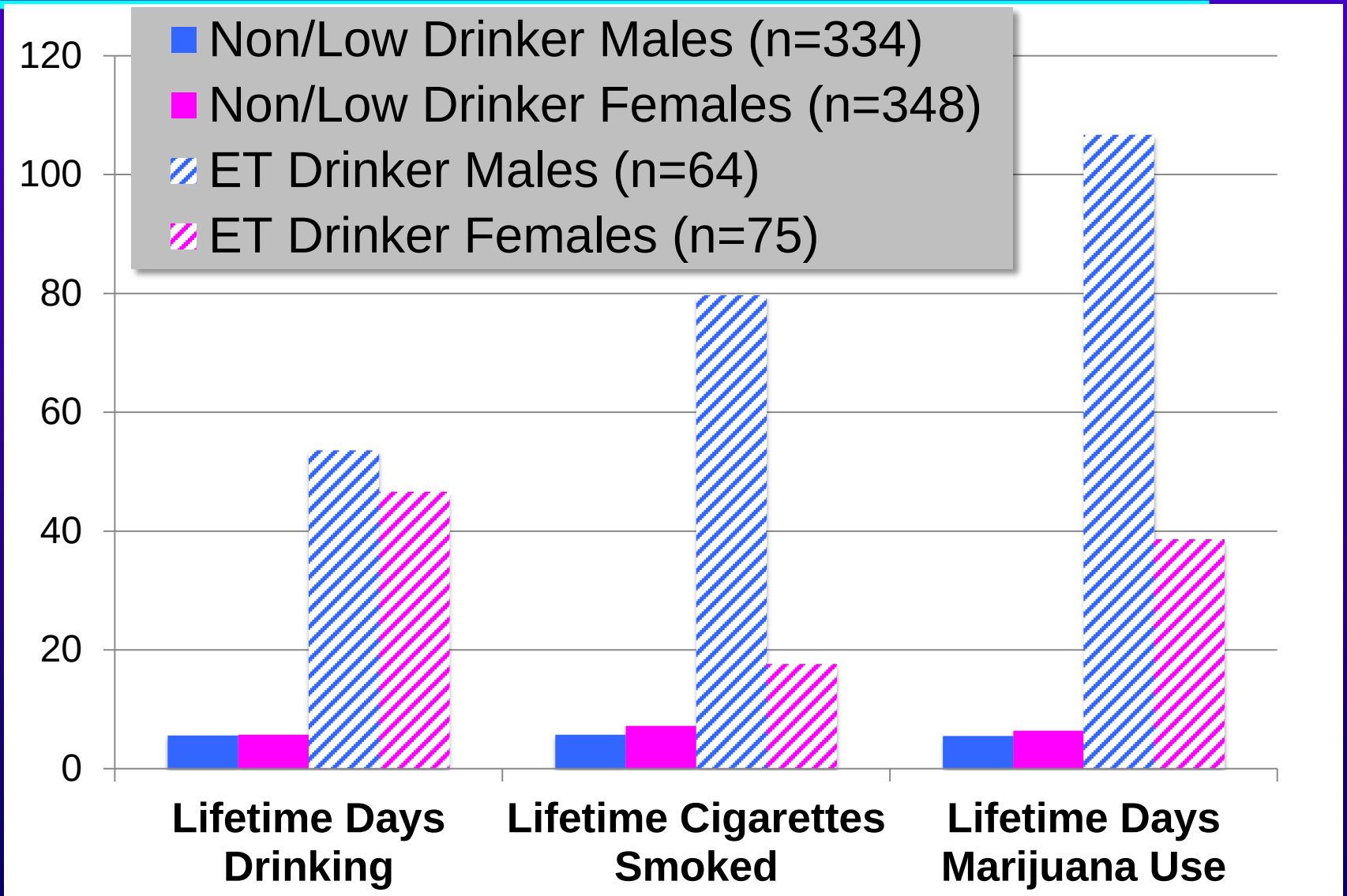
	Non/Low Drinker (N=692)		Exceeded Threshold (N=139)	
	Male	Female	Male	Female
	(n=334)	(n=348)	(n=64)	(n=75)
Age (mean years)	15.6	15.8	18.4	18.5
Pubertal Development Scale (median)	3.0	3.6	3.6	4.0
Socioeconomic status (mean)	17.0	16.6	17.1	17.3
% Right-handed	76%	83%	83%	81%

Sample Description

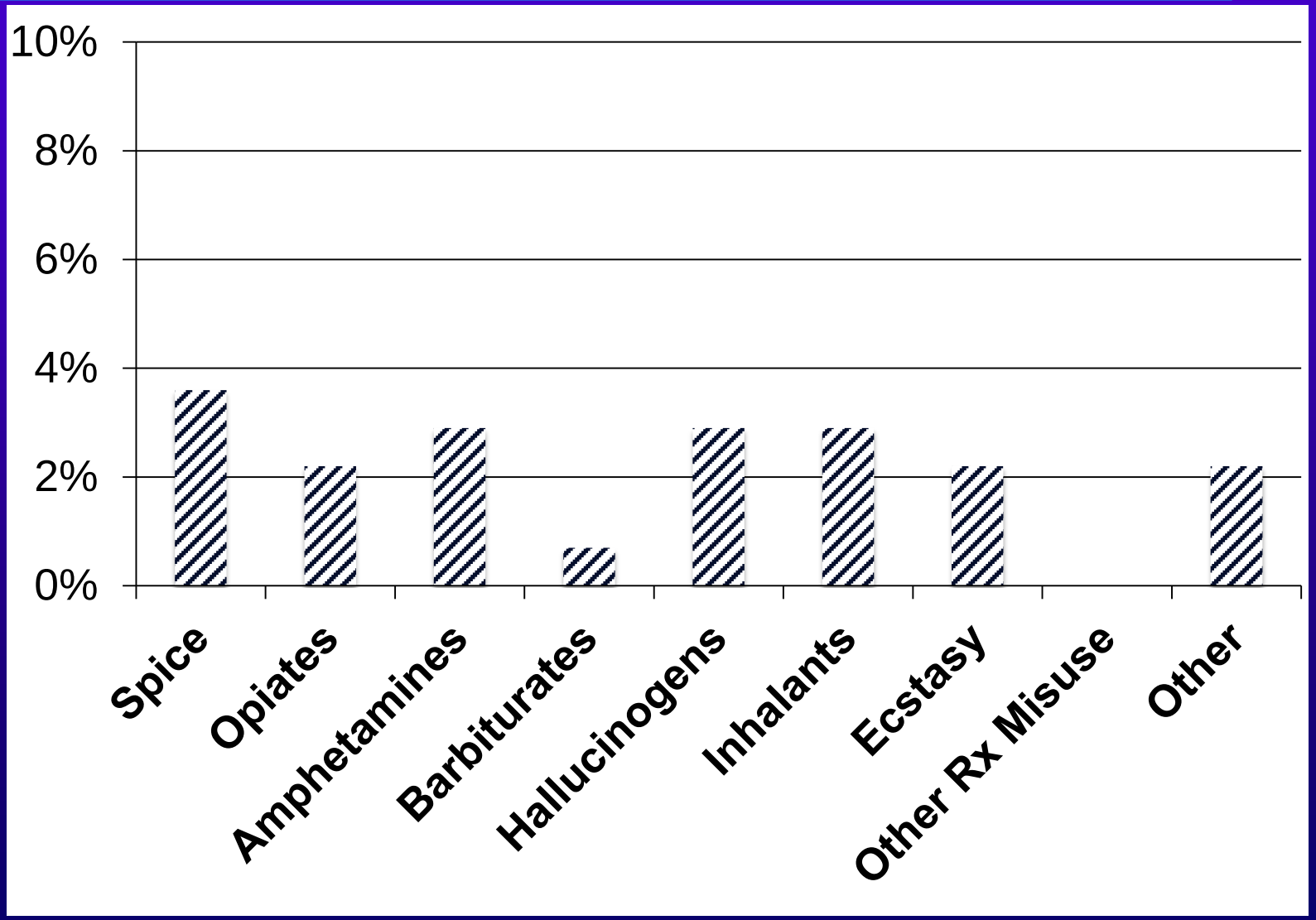
- 88% reside with one or both parents
- 27% parents divorced/separated/single
- 20% below college degree
- 18% household income <$50k/yr*
- 85% normal BMI (13% above, 2% under)

*higher in ET Drinkers ($p<.05$)

Substance Use at Baseline



Lifetime Other Drug Use: ET at Baseline (% of 139)



Risk Criteria: Target 50%

1. 1st full drink <age 15

   (Grant & Dawson, 1997)

2. Family history of substance use disorder

   (Edenberg et al., 1998; Schuckit & Smith, 1996)

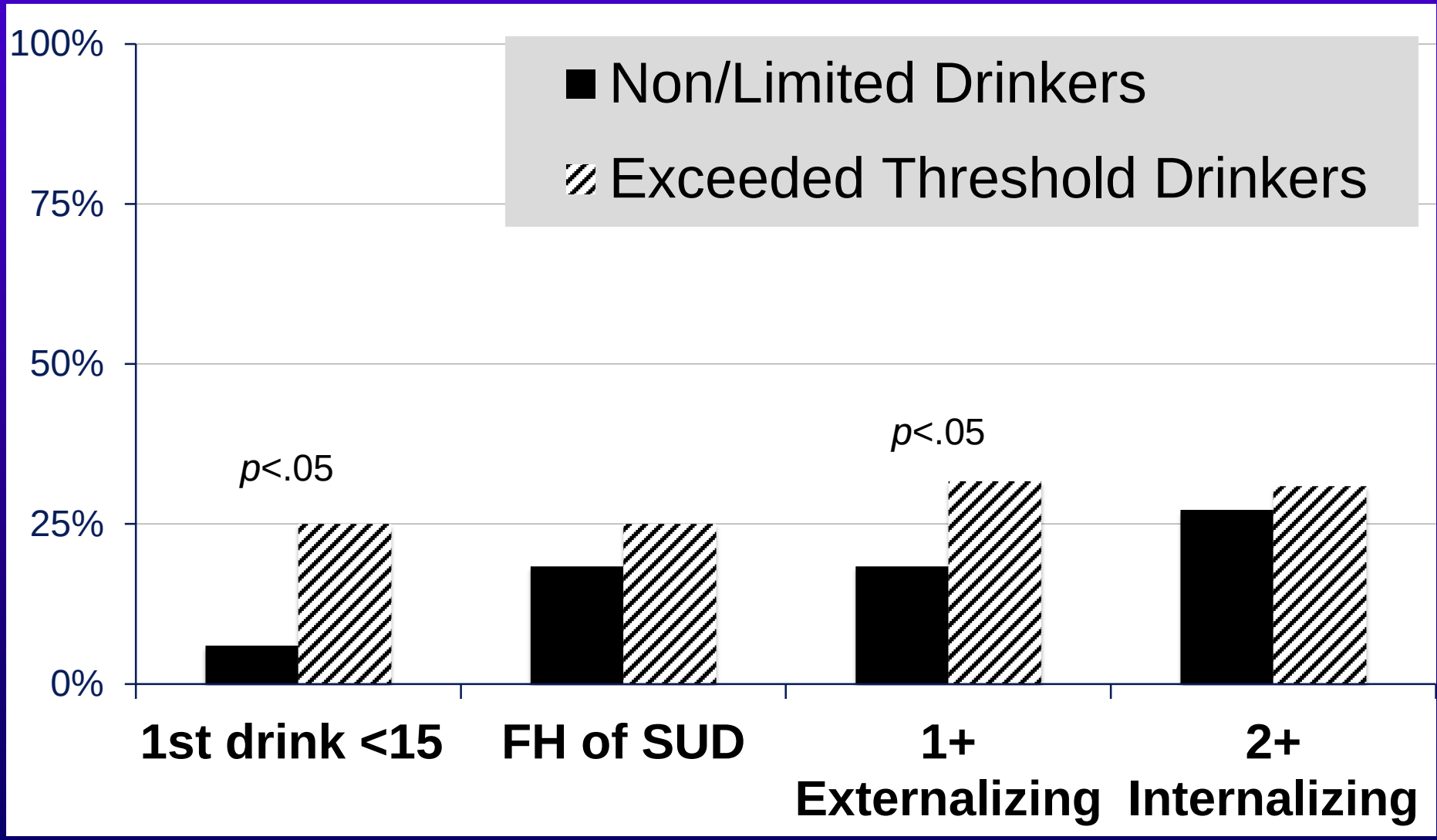
3. 1+ externalizing symptoms

   (Brown et al., 1996; Myers et al., 1995; Slutske et al., 1998)

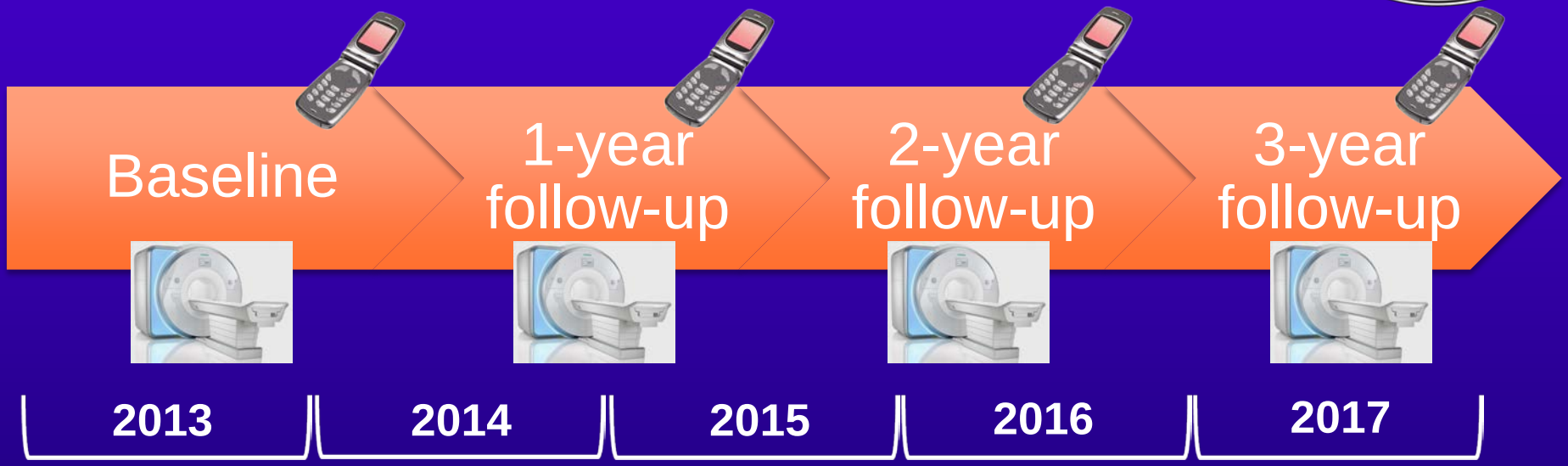
4. 2+ internalizing symptom

   (Chassin, et al., 2002; Hussong et al., 2011)

47% with 1+ Risk Factor for Heavy Drinking



NCANDA Follow-up Design



- 4 assessments with imaging
  + Half-yearly telephone interviews

- 6-month: 98% of 831 done.
- 1-year: in progress, >90% complete.

Next Directions

- Begin to test Aims 1 and 5:
  - Effects of adolescent drinking on trajectory of adolescent brain development
  - Neural, cognitive, and affective markers predicting addiction & psychopathology

NCANDA Summary

- Exceeded recruitment goals on time
- Nationally representative sample
- Procedures and protocol set a standard
- High follow-up rates
- 47% with risk factors

→ Suggests aims can be tested

Acknowledgements

- U01 AA021695 (SAB+SFT)
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- U01 AA021692 (SFT)
- U01 AA021681 (MDDB)
- U01 AA021690 (DBC)
- U01 AA021691 (BN)
- U01 AA021696 (IMC+FCB)
- T32 AA013525 (TB)

National Institute on Alcohol Abuse and Alcoholism

- NIAAA Program Staff
- NCANDA Scientific Advisory Board
- NCANDA Co-Investigators
- NCANDA Research Associates