



 Non-Imaging Domains > Substance Use

Substance Use

DOI: [10.15154/8873-zj65](#) (Release 5.0)

PUBLISHED
June 30, 2023

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Name of Instrument	Subdomain	Table Name
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General Information

An overview of the ABCD Study® can be found at abcdstudy.org and detailed descriptions of the assessment protocols are available at [ABCD Protocols](#). This page describes the contents of various instruments available for download. To understand the context of this information, refer to the release note [Start Page](#).

Detailed information about the instruments, the constructs they are intended to measure, and relevant citations for each measure are provided in the following:

Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental Cognitive Neuroscience*, 32, 80-96. [Find here](#)

For additional information about 1-year to 3-year follow-up substance use methods and Baseline to 3-year follow-up substance use base rates, see

Sullivan RM, Wade NE, Wallace AL, Tapert SF, Pelham WE 3rd, Brown SA, Cloak CC, Feldstein Ewing SW, Madden PAF, Martz ME, Ross JM, Kaiver CM, Wirtz HG, Heitzeg MM, Lisdahl KM. Substance use patterns in 9 to 13-year-olds: Longitudinal findings from the Adolescent Brain Cognitive Development (ABCD) study. *Drug Alcohol Depend Rep*. 2022 Dec;5:100120. [Find here](#)

Updates and Notes

COVID-19 and Substance Use Toxicology Measures

In response to COVID-19 restrictions beginning in March 2020, ABCD pivoted to remote testing when in-person testing was not possible or feasible, and a subsequent hybrid in-person/remote testing procedure as sites allowed. This affected the 2-, 3-year, and 4-year follow-up assessments conducted from March 2020 through December 2021. The switch to remote testing did not allow for toxicology testing (i.e., urine, hair, saliva). Remote and hybrid testing (i.e., some on-site, some remote) required participants to complete some tasks and surveys on their own devices (i.e., phone, tablet, desktop, or laptop computer). When possible, remote performance was monitored by research associates using Zoom's screen sharing feature. Youth participants were asked to find a private place in their home to complete some substance use measures, but this was not always possible. This lack of control over privacy for surveys taken at home may affect responses and users should consider this when analyzing data spanning from the pre-COVID-19 and post-COVID-19 periods.

Determining In-person, remote, and Hybrid for Overall Visit Type

Refer to the release note [Start Page](#).

Instrument Descriptions

Youth Instruments

Alcohol Toxicology

Release 5.0 Data Table: su_y_alc_tox

Measure Description: Toxicology assessment of past day use of alcohol measured by breathalyzer.

ABCD Subdomain: Drug Toxicology

Number of Variables: 9

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: If testing was conducted over several days, the breathalyzer was administered at the beginning of each day.

Hair Drug Toxicology

Release 5.0 Data Table: su_y_hair_tox

Measure Description: Hair toxicology results for drugs and metabolites indicating substance use in the past month or longer (up to 3-months; beginning at ~8 days after consumption when hair with drug grows from the scalp) and information collected at the time of collection such as hair length, color and collection date.

ABCD Subdomain: Drug Toxicology

Number of Variables: 105

Summary Score(s): Yes

Measurement Waves Administered: Hair is collected annually since baseline. A subsample of hair is sent for analysis twice per year. Not all hair is tested due to budgetary constraints. Initially 5% of a site's population were requested annually for analysis based on a "high risk for substance use" algorithm. The algorithm is found [here](#). Participants with a prior positive hair toxicology finding were included in the requested samples. Currently, we analyze samples from approximately 20% of participants at each site obtained from a single wave of collection (e.g., 2-year follow-up). We expanded the pool of samples to include a proportion of randomly selected "low risk for substance use" participants to provide a baseline of use to compare to the "high risk" participants. In addition, special funds were acquired to test a small portion (2%) of ABCD participants on an annual basis, including participants or parents who report substance use, and low-risk participants. Reason for selection for analysis is included within the dataset.

Modifications since initial administration: For completion of a full drug panel with screening and confirmation analysis, 100mg of the closest 3.9cm of hair to the scalp are needed. However, some collected samples do not have sufficient quantity to meet this threshold (quantity not sufficient, or QNS). In these instances, a testing order priority list, consistent with the aims of the ABCD Study, is implemented. Cannabinoids are screened and tested first, followed by other drugs of interest (e.g., alcohol), with prescribed drugs (e.g., amphetamines) or drugs which are more commonly reported (e.g., nicotine) ranked as a lower priority for testing. Thus, all hair is used from every sample to meet the goals of the study. Drugs are first screened by immunoassay, with presumptive positives tested by LC-MS-MS or GC-MS-MS. There are two exceptions: THCCOOH and alcohol (EtG) analyses are directly tested by GS-MS-MS. For a brief period in fall 2022, approximately 600 EtG samples were directly tested by LC-MS-MS and, if positive, tested by GC-MS-MS, as this is the standard legal protocol. However, as there is often insufficient hair to run both analyses, only LC-MS-MS testing was done. The protocol was revised back to its original protocol of only testing EtG by GC-MS-MS. Because of this brief variation, separate variables are provided for EtG based on gas chromatography or liquid chromatography results. Hair color, length, and cosmetical treatment (e.g., flat iron; perm) is documented during the 2-year follow-up of ABCD data collection.

Notes and special considerations: Hair samples were not collected for remote visits. This affected participants in the latter part of the 2-year follow-up, the middle of the 3-year follow-up, and a small proportion of early 4-year follow-up assessments. All hair testing is conducted by Psychemedics Corporation.

Hair testing methods were selected with the help of Psychemedics to optimally meet the goals of the ABCD Study. Importantly, given the young age of participants and their nascent substance use, all hair samples are tested at the level of detection/quantification (LOD/LOQ) to maximize sensitivity in identifying youth substance use. Psychemedics uses an extensive hair wash protocol to mitigate against external contamination. Each positive sample is reviewed by an expert at Psychemedics to compare quantified results to a sample-based standard, through an algorithm determined by the wash contents, which indicates that a positive is above what could be expected from external contamination. Thus, while an LOD/LOQ is set as a threshold, a sample may be labeled as "Negative" if the expert determined the quantified value is not substantially different enough from wash contents, indicating potential for external contamination (Morris-Kukoski, Montgomery, & Hammer, 2014; Hill et al., 2005). Psychemedics tests these drug classes: cocaine, opioids, phencyclidine, amphetamines, cannabinoids, alcohol, nicotine, fentanyl, and benzodiazepines, and analytes from most drug classes, to improve knowledge about each substance used by further assessing metabolites to confirm personal consumption of the drug. These combined processes maximize sensitivity through low LOD/LOQ with extended wash using a wash criterion and considering specific drug analytes to mitigate against general hair testing concerns (e.g., potential external contamination; potential melanin-based binding for some drugs), leading to more accurate results.

References: Wade, N. E., Tapert, S. F., Lisdahl, K. M., Huestis, M. A., & Haist, F. (2022). Substance use onset in high-risk 9-13 year-olds in the ABCD study. *Neurotoxicol Teratol*, 91, 107090. [Find here](#)

Wade, N. E., Sullivan, R. M., Tapert, S. F., Pelham, W. E., 3rd, Huestis, M. A., Lisdahl, K. M., & Haist, F. (2023). Concordance between substance use self-report and hair analysis in community-based adolescents. *Am J Drug Alcohol Abuse*, 49(1), 76-84. [Find here](#)

Nicotine Toxicology

Release 5.0 Data Table: su_y_nic_tox

Measure Description: Urine toxicology assessment of recent use of nicotine.

ABCD Subdomain: Drug Toxicology

Number of Variables: 21

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: A proportion of participants (10%) were randomly tested from baseline to 3-year follow-up. These tests used the NicAlert ([Jant Pharmacal Corp.](#)). The NicAlert urine test has since been discontinued. Beginning in the 4-year follow-up assessment, all participants were tested using the Allere iScreen ([Abbott](#)).

Notes and special considerations: None

Saliva Drug Toxicology

Release 5.0 Data Table: su_y_sal_tox

Measure Description: Saliva measure of recent drug use.

ABCD Subdomain: Drug Toxicology

Number of Variables: 24

Summary Score(s): NA

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: From baseline to the 3-year follow-up, a randomly selected proportion of participants (10%) were tested using the Dräger oral fluid system ([Dräger](#)). Beginning at the 4-year follow-up, the Dräger oral fluid was administered after a positive Urine Drug Toxicology test (see below).

Notes and special considerations: None

Urine Drug Toxicology

Release 5.0 Data Table: su_y_uri_tox

Measure Description: Urine test for recent drug use.

ABCD Subdomain: Drug Toxicology

Number of Variables: 105

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: The urine toxicology test was introduced starting in the 4-year follow-up. This test uses the Allere iCup testing system ([Abbott](#)). A positive test result is followed up with a Saliva Drug Toxicology test described above.

Alcohol Expectancies - Brief Adolescent (AEQ-AB)

Release 5.0 Data Table: su_y_alc_exp

Measure Description: Measures thoughts, feelings and beliefs about effects of alcohol use. Asked if "heard of" alcohol. The AEQ-AB was designed as a brief version of Alcohol Expectancy Questionnaire-Adolescent (Brown, Christiansen and Goldman, 1987; Greenbaum, Brown and Friedman, 1995). This 7-item instrument is intended for use among clinicians to assess and test alcohol expectancy effects (Stein, Katz, Colby, Barnett, Golembeske, Lebeau-Craven and Monti, 2006).

ABCD Subdomain: SU Attitude

Number of Variables: 14

Summary Score(s): Yes

Measurement Waves Administered: Annually from baseline to 3-year follow-up. Expected future assessment at 5-year and 7-year follow-ups.

Modifications since initial administration: Starting with the 3-year follow-up, participants were no longer asked the "heard of" questions.

Notes and special considerations: None

References: Brown, S. A., Christiansen, B. A., & Goldman, M. S. (1987). The Alcohol Expectancy Questionnaire: an instrument for the assessment of adolescent and adult alcohol expectancies. *Journal of studies on alcohol*, 48(5), 483–491. [Find here](#)

Greenbaum, P. E., Brown, E. C., & Friedman, R. M. (1995). Alcohol expectancies among adolescents with conduct disorder: prediction and mediation of drinking. *Addictive behaviors*, 20(3), 321–333. [Find here](#)

Stein, L. A., Katz, B., Colby, S. M., Barnett, N. P., Golembeske, C., Lebeau-Craven, R., & Monti, P. M. (2007). Validity and Reliability of the Alcohol Expectancy Questionnaire-Adolescent, Brief. *Journal of child & adolescent substance abuse*, 16(2), 115–127. [Find here](#)

Alcohol Motives (PhenX)

Release 5.0 Data Table: su_y_alc_motiv

Measure Description: The coping and enhancement subscales from the Drinking Motives Questionnaire Revised (DMQ-R) consists of 20 questions about the respondent's coping and enhancement motives (reasons) for drinking alcohol. The respondent is asked to respond to each question via a five-item scale ranging from 1 for "almost never/never" to 5 for "almost always/always." This is a PhenX measure. [Find here](#)

ABCD Subdomain: SU Attitude

Number of Variables: 21

Summary Score(s): No

Measurement Waves Administered: 4-year follow-up. Expected future assessment at 6-year follow-up.

Modifications since initial administration: None

Notes and special considerations: None

References: Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, 6, 117–128. [Find here](#)

Grant, V. V., Stewart, S. H., O'Connor, R. M., Blackwell, E., & Conrod, P. J. (2007). Psychometric evaluation of the five-factor Modified Drinking Motives Questionnaire–Revised in undergraduates. *Addictive behaviors*, 32(11), 2611–2632. [Find here](#)

Kuntsche, E., & Kuntsche, S. (2009). Development and validation of the Drinking Motive Questionnaire Revised Short Form (DMQ-R SF). *Journal of clinical child and adolescent psychology* : the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53, 38(6), 899–908. [Find here](#)

Marijuana Expectancies (MEEQ-B)

Release 5.0 Data Table: su_y_can_exp

Measure Description: Measures thoughts, feelings and beliefs about effects of marijuana. Asked if “heard of” marijuana question was answered positively.

ABCD Subdomain: SU Attitude

Number of Variables: 13

Summary Score(s): Yes

Measurement Waves Administered: Annually from Baseline to 3-year follow-up. Expected future assessments in 5-year and 7-year follow-ups

Modifications since initial administration: Starting with the 3-year follow-up, participants were no longer asked the “heard of” questions.

Notes and special considerations: None

Reference: Torrealday, O., Stein, L. A., Barnett, N., Golembeske, C., Lebeau, R., Colby, S. M., & Monti, P. M. (2008). Validation of the Marijuana Effect Expectancy Questionnaire-Brief. *Journal of child & adolescent substance abuse*, 17(4), 1–17. [Find here](#)

Marijuana Motives (PhenX)

Release 5.0 Data Table: su_y_can_motiv

Measure Description: This is a modified version of the PhenX Marijuana Motives Questionnaire. It consists of 25 questions about the respondent’s coping and enhancement motives (reasons) for using marijuana. The respondent is asked to respond to each question via a five-item scale ranging from 1 for “almost never/never” to 5 for “almost always/always.”

ABCD Subdomain: SU Attitude

Number of Variables: 26

Summary Score(s): No

Measurement Waves Administered: 4-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

References: Lee, C. M., Neighbors, C., Hendershot, C. S., & Grossbard, J. R. (2009). Development and preliminary validation of a comprehensive marijuana motives questionnaire. *Journal of studies on alcohol and drugs*, 70(2), 279–287. [Find here](#)

Simons, J., Correia, C. J., Carey, K. B., & Borsari, B. E. (1998). Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. *Journal of Counseling Psychology*, 45(3), 265. [Find here](#)

Vaping Expectancies

Release 5.0 Data Table: su_y_vap_exp

Measure Description: Measures thoughts, feelings and beliefs about effects of vaping. This was adapted from the Marijuana Expectancies measure described above [here](#).

ABCD Subdomain: SU Attitude

Number of Variables: 10

Summary Score(s): No

Measurement Waves Administered: 3-year follow-up (introduced midway through collection of 3-year follow-up data assessment). Expected future assessment at 5-year follow-up.

Modifications since initial administration: None

Notes and special considerations: Because this measure was introduced midway through the 3-year follow-up assessment, a proportion of participants did not receive the measure and appear as missing data.

Reference: Torrealday, O., Stein, L. A., Barnett, N., Golembeske, C., Lebeau, R., Colby, S. M., & Monti, P. M. (2008). Validation of the Marijuana Effect Expectancy Questionnaire-Brief. *Journal of child & adolescent substance abuse*, 17(4), 1–17. [Find here](#)

Vaping Motives

Release 5.0 Data Table: su_y_vap_motiv

Measure Description: Reasons for vaping. This inventory was created by a subgroup on the ABCD Substance Use workgroup, including Drs. Krista Lisdahl, Mary Heitzeg, Marsha Lopez, Susan Tapert, and Gaya Dowling. The instructions were modified from the MTF 2020 interview and Tobacco Motive Inventory and items were modified from the Reasons for ENDS Use, PATH Study, Tobacco Motive Inventory with additional items created by the subgroup.

ABCD Subdomain: SU Attitude

Number of Variables: 10

Summary Score(s): No

Measurement Waves Administered: 2-year and 4-year follow-up. Expected future assessment at 6-year follow-up.

Modifications since initial administration: None

Notes and special considerations: The Vaping Motives questionnaire was administered midway through the 2-year follow-up. Thus, a proportion of participants in this assessment wave were not administered the questionnaire and will appear as missing.

Reference: Diez, S. L., Cristello, J. V., Dillon, F. R., De La Rosa, M., & Trucco, E. M. (2019). Validation of the electronic cigarette attitudes survey (ECAS) for youth. *Addictive behaviors*, 91, 216–221. [Find here](#)

Cigarette Expectancies (ASCQ)

Release 5.0 Data Table: su_y_nic_exp

Measure Description: Measure of thoughts, feelings, and beliefs about effects of smoking nicotine.

ABCD Subdomain: SU Attitude

Number of Variables: 19

Summary Score(s): Yes

Measurement Waves Administered: Baseline through 3-year follow-up. Expected future assessments at 5-year and 7-year follow-up.

Modifications since initial administration: None

Notes and special considerations: The 7th question of the ASCQ, "During the day, smoking can help kill time if there is nothing to do.", was added in 2019, part way through 2-year follow up visits. Thus, a proportion of participants in this assessment wave were not administered this question.

Reference: Lewis-Esquerre, J. M., Rodrigue, J. R., & Kahler, C. W. (2005). Development and validation of an adolescent smoking Consequence questionnaire. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*, 7(1), 81–90. [Find here](#)

Tobacco Motives

Release 5.0 Data Table: su_y_nic_motiv

Measure Description: Motives for using tobacco products.

ABCD Subdomain: SU Attitudes

Number of Variables: 20

Summary Score(s): No

Measurement Waves Administered: 4-year follow-up. Expected future assessment at 6-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

Reference: Smith, S. S., Piper, M. E., Bolt, D. M., Fiore, M. C., Wetter, D. W., Cinciripini, P. M., & Baker, T. B. (2010). Development of the Brief Wisconsin Inventory of Smoking Dependence Motives. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*, 12(5), 489–499. [Find here](#)

ENDS Expectancies (CEQ)

Release 5.0 Data Table: su_y_ends_exp

Measure Description: Measure of thoughts, feelings and beliefs about effects of using electronic nicotine delivery systems (ENDS).

ABCD Subdomain: SU Attitude

Number of Variables: 15

Summary Score(s): Yes

Measurement Waves Administered: 3-year follow-up. Expected future assessments in 5-year and 7-year follow-ups.

Modifications since initial administration:** None

Notes and special considerations: None.

Reference: Pokhrel, P., Lam, T.H., Pagano, I., Kawamoto, C.T., & Herzog, T.A. (2018). YPokhrel, P., Lam, T. H., Pagano, I., Kawamoto, C. T., & Herzog, T. A. (2018). Young adult e-cigarette use outcome expectancies: Validity of a revised scale and a short scale. *Addictive behaviors*, 78, 193–199. [Find here](#)

ENDS Motives

Release 5.0 Data Table: su_y_ends_motiv

Measure Description: Motives for using electronic nicotine delivery systems (ENDS).

ABCD Subdomain: SU Attitudes

Number of Variables: 20

Summary Score(s): No

Measurement Waves Administered: 4-year follow-up. Expected future assessment at 6-year follow-up

Modifications since initial administration: None

Notes and special considerations: None.

References: Centers for Disease Control (CDC; Division of Nutrition). (2016). Anthropometry Procedures Manual. [Find here](#)

Piper, M. E., Piasecki, T. M., Federman, E. B., Bolt, D. M., Smith, S. S., Fiore, M. C., & Baker, T. B. (2004). A multiple motives approach to tobacco dependence: the Wisconsin Inventory of Smoking Dependence Motives (WISDM-68). *Journal of consulting and clinical psychology*, 72(2), 139–154. [Find here](#)

Reasons for ENDS Use

Release 5.0 Data Table: su_y_ends_reas

Measure Description: Reasons for using electronic nicotine delivery systems (ENDS).

ABCD Subdomain: SU Attitude

Number of Variables: 25

Summary Score(s): No

Measurement Waves Administered: 4-year follow-up. Expected future assessment at 6-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

References: Wills, T. A., Sandy, J. M., & Yaeger, A. M. (2002). Moderators of the relation between substance use level and problems: test of a self-regulation model in middle adolescence. *Journal of abnormal psychology*, 111(1), 3–21. [Find here](#)

Piper, M. E., Piasecki, T. M., Federman, E. B., Bolt, D. M., Smith, S. S., Fiore, M. C., & Baker, T. B. (2004). A multiple motives approach to tobacco dependence: the Wisconsin Inventory of Smoking Dependence Motives (WISDM-68). *Journal of consulting and clinical psychology*, 72(2), 139–154. [Find here](#)

Peer Tolerance SU (PhenX)

Release 5.0 Data Table: su_y_peertoler

Measure Description: Measure of how youth believes their close friends would feel about them engaging in substance use behaviors, including drinking, smoking, using e-cigarettes, marijuana

use, nonmedical use of prescription drugs, and "other drug" use. Modified from *Monitoring the Future* PhenX form ([Find here](#)).

ABCD Subdomain: SU Attitude

Number of Variables: 17

Summary Score(s): No

Measurement Waves Administered: Baseline through 4-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

References: Johnston, Lloyd D.; O'Malley, P. M.; Bachman, J. G.; Schulenberg, J. E.. (2009). *Monitoring the Future. National Results on Adolescent Drug Use: Overview of Key Findings, 2009*. NIH Publication Number 10-7583 [Find here](#)

Miech, R. A.; Johnston, L. D.; O'Malley, P. M.; Bachman, J. G.; Schulenberg, J. E.. (2015). *Monitoring the Future National Survey Results on Drug Use, 1975-2014. Volume 1, Secondary School Students*. Ann Arbor: Institute for Social Research: The University of Michigan. [Find here](#)

Peer Deviance SU (PhenX)

Release 5.0 Data Table: su_y_peerdevia

Measure Description: Measures friends' use of alcohol, nicotine, marijuana, inhalants, and "other" drugs.

ABCD Subdomain: SU Attitude

Number of Variables: 19

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: Freedman, D., Thornton, A., Camburn, D., Alwin, D., & Young-demarco, L. (1988). The life history calendar: a technique for collecting retrospective data. *Sociological methodology*, 18, 37-68. [Find here](#)

PATH Intention to Use

Release 5.0 Data Table: su_y_path_intuse

Measure Description: Measures youth's intention to use alcohol, nicotine and marijuana.

ABCD Subdomain: SU Attitude**Number of Variables:** 35**Summary Score(s):** No**Measurement Waves Administered:** Annually since baseline

Modifications since initial administration: Beginning at the 3-year follow-up, there was a change to some questions in the Youth PATH Intention to Use Tobacco Survey (ITU) to differentiate between cigarettes and electronic nicotine delivery systems (ENDS), detailed below:

The `path_alc_youth1_l` question of *Have you ever been curious about using a tobacco product such as cigarettes, e-cigarettes, hookah, or cigars?* was divided into the following questions and variables:

- *Have you ever been curious about using a cigarette?* with the variable name `path_alc_youth1a_l`.
- *Have you ever been curious about using an electronic nicotine or vaping product, such as e-cigarettes, vape pens, or Juuls?* with the variable name `path_alc_youth1b_l`

The following logic was used for 3-year follow up data to populate the variable `path_alc_youth1_l`:

- Response options are: 1, Very curious | 2, Somewhat curious | 3, A little curious | 4, Not at all curious | 5, Don't know | 6, Refused to answer
- If the response for EITHER new question is **<5** populate `path_alc_youth1_l` with the LOWEST of the two numbers (i.e., the greatest endorsed curiosity)
- If response to BOTH new questions are **5** populate `path_alc_youth1_l` with 5.
- If **one response is 5 and one is 6** for the two new questions, populate `path_alc_youth1_l` with 5
- If response to BOTH new questions are **6** populate `path_alc_youth1_l` with 6.

The `path_alc_youth4_l` question of *Do you think you will try a tobacco product soon?* was divided into the following questions and variables:

- *Do you think will try a cigarette soon?* with the variable name `path_alc_youth4a_l`.
- *Do you think you will try an electronic nicotine or vaping product, such as e-cigarettes, vape pens, or Juuls, soon?* with the variable name `path_alc_youth4b_l`.

The following logic was used for 3-year follow up data to populate the variable `path_alc_youth4_l`:

- Response options are: 1, Definitely yes | 2, Probably yes | 3, Probably not | 4, Definitely not | 5, Don't know | 6, Refused to answer

- If the response for EITHER new question is **<5** populate `path_alc_youth4_l` with the LOWEST of the two numbers (i.e., the greatest likelihood of trying soon)
- If response to BOTH new questions are **5** populate `path_alc_youth4_l` with 5.
- If **one response is 5 and one is 6** for the two new questions, populate `path_alc_youth4_l` with 5
- If response to BOTH new questions are **6** populate `path_alc_youth4_l` with 6.

The `path_alc_youth7_l` question of *If one of your best friends were to offer you a tobacco product, would you try it?* was divided into the following questions and variables:

- *If one of your best friends were to offer you a cigarette, would you try it?* with the variable name `path_alc_youth7a_l`.
- *If one of your best friends were to offer you an electronic nicotine or vaping product, such as e-cigarettes, vape pens, or Juuls, would you try it?* with the variable name `path_alc_youth7b_l`.

The following logic was used for 3-year follow up data to populate the variable `path_alc_youth7_l`:

- Response options are: 1, Definitely yes | 2, Probably yes | 3, Probably not | 4, Definitely not | 5, Don't know | 6, Refused to answer
- If the response for EITHER new question is **<5** populate `path_alc_youth7_l` with the LOWEST of the two numbers (i.e., the greatest likelihood of trying if friend offered)
- If response to BOTH new questions are **5** populate `path_alc_youth7_l` with 5.
- If **one response is 5 and one is 6** for the two new questions, populate `path_alc_youth7_l` with 5
- If response to BOTH new questions are **6** populate `path_alc_youth7_l` with 6.

Notes and special considerations: None

References: Pierce, J. P., Choi, W. S., Gilpin, E. A., Farkas, A. J., & Merritt, R. K. (1996). Validation of susceptibility as a predictor of which adolescents take up smoking in the United States. *Health psychology : official journal of the Division of Health Psychology, American Psychological Association*, 15(5), 355–361. [Find here](#)

Strong, D. R., Hartman, S. J., Nodora, J., Messer, K., James, L., White, M., Portnoy, D. B., Choiniere, C. J., Vullo, G. C., & Pierce, J. (2015). Predictive Validity of the Expanded Susceptibility to Smoke Index. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*, 17(7), 862–869. [Find here](#)

Perceived Harm SU (PhenX)

Release 5.0 Data Table: `su_y_percharm`

Measure Description: Measure of youth's opinion regarding how much people risk harming themselves (physically or in other ways) if they engage in various substance use behaviors, including drinking, smoking, using e-cigarettes, marijuana use, nonmedical use of prescription drugs, and "other drug" use. Modified from *Monitoring the Future* PhenX form ([Find here](#)).

ABCD Subdomain: SU Attitude

Number of Variables: 17

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Johnston, Lloyd D.; O'Malley, P. M.; Bachman, J. G.; Schulenberg, J. E.. (2009). *Monitoring the Future. National Results on Adolescent Drug Use: Overview of Key Findings*, 2009. NIH Publication Number 10-7583. [Find here](#)

Miech, R. A.; Johnston, L. D.; O'Malley, P. M.; Bachman, J. G.; Schulenberg, J. E.. (2015). *Monitoring the Future National Survey Results on Drug Use, 1975-2014. Volume 1, Secondary School Students*. Ann Arbor: Institute for Social Research: The University of Michigan. [Find here](#)

Alcohol Subjective Effects (SRE; PhenX)

Release 5.0 Data Table: su_y_alc_eff

Measure Description: Sensitivity to alcohol effects. This is a modification of the PhenX instrument found [here](#).

ABCD Subdomain: SU Consequence

Number of Variables: 31

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: Schuckit, M. A., Smith, T. L., & Tipp, J. E. (1997). The Self-Rating of the Effects of alcohol (SRE) form as a retrospective measure of the risk for alcoholism. *Addiction* (Abingdon, England), 92(8), 979-988. [Find here](#)

Alcohol Hangover Symptoms (HSS)

Release 5.0 Data Table: su_y_alc_hss

Measure Description: Measures frequency of hangover symptoms over the last 6 months. The HSS queries 13 hangover symptoms that are manifestations of toxic neurologic effects, measured on a scale ranging from never to 100% of drinking occasions (Slutske, Piasecki, & Hunt-Carter, 2003).

ABCD Subdomain: SU Consequence

Number of Variables: 41

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: Slutske, W. S., Piasecki, T. M., & Hunt-Carter, E. E. (2003). Development and initial validation of the Hangover Symptoms Scale: prevalence and correlates of Hangover Symptoms in college students. *Alcoholism, clinical and experimental research*, 27(9), 1442–1450. [Find here](#)

Alcohol Problems (RAPI)

Release 5.0 Data Table: su_y_alc_rapi

Measure Description: Symptom frequency checklist of alcohol-related problems over the past 6 months. The RAPI queries how many times in the last year the participant has felt a certain consequence for drinking alcohol (White, H.R. & Labouvie, E.W. 1989).

ABCD Subdomain: SU Consequence

Number of Variables: 37

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of studies on alcohol*, 50(1), 30–37. [Find here](#)

Marijuana Subjective Effects

Release 5.0 Data Table: su_y_can_eff

Measure Description: Sensitivity to cannabis effects in early use experiences.

ABCD Subdomain: SU Consequence

Number of Variables: 25

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Agrawal, A., Madden, P. A., Bucholz, K. K., Heath, A. C., & Lynskey, M. T. (2014). Initial reactions to tobacco and cannabis smoking: a twin study. *Addiction* (Abingdon, England), *109*(4), 663–671. [Find here](#)

Agrawal, A., Madden, P. A., Martin, N. G., & Lynskey, M. T. (2013). Do early experiences with cannabis vary in cigarette smokers?. *Drug and alcohol dependence*, *128*(3), 255–259. [Find here](#)

Marijuana Withdrawal (CWS)

Release 5.0 Data Table: su_y_can_cws

Measure Description: Past 24-hr experience of cannabis withdrawal symptoms.

ABCD Subdomain: SU Consequence

Number of Variables: 18

Summary Score(s): No

Measurement Waves Administered: Annually since 3-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

Reference: Allsop, D. J., Norberg, M. M., Copeland, J., Fu, S., & Budney, A. J. (2011). The Cannabis Withdrawal Scale development: patterns and predictors of cannabis withdrawal and distress. *Drug and alcohol dependence*, *119*(1-2), 123–129. [Find here](#)

Marijuana Problems (MAPI)

Release 5.0 Data Table: su_y_can_mapi

Measure Description: Symptom frequency checklist of marijuana-related problems over the past 6 months. MAPI (adapted from the RAPI; see above) queries the frequency of physiological and psychological consequences of marijuana use.

ABCD Subdomain: SU Consequence

Number of Variables: 37

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Johnson, V., & White, H. R. (1989). An investigation of factors related to intoxicated driving behaviors among youth. *Journal of studies on alcohol*, 50(4), 320–330. [Find here](#)

Zvolensky, M. J., Vujanovic, A. A., Bernstein, A., Bonn-Miller, M. O., Marshall, E. C., & Leyro, T. M. (2007). Marijuana use motives: A confirmatory test and evaluation among young adult marijuana users. *Addictive behaviors*, 32(12), 3122–3130. [Find here](#)

Drug Problems (DAPI)

Release 5.0 Data Table: su_y_dapi

Measure Description: Symptom frequency checklist of “other” drug-related problems over past 6 months

ABCD Subdomain: SU Consequence

Number of Variables: 37

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Johnson, V., & White, H. R. (1989). An investigation of factors related to intoxicated driving behaviors among youth. *Journal of studies on alcohol*, 50(4), 320–330. [Find here](#)

Caldwell, P. E. (2002). Drinking levels, related problems and readiness to change in a college sample. *Alcoholism Treatment Quarterly*, 20(2), 1-15. [Find here](#)

Kingston, J., Clarke, S., Ritchie, T., & Remington, B. (2011). Developing and validating the “composite measure of problem behaviors”. *Journal of clinical psychology*, 67(7), 736–751. [Find here](#)

KSADS—Alcohol/Drug Use Disorder (Youth)

Release 5.0 Data Table: su_y_ksads_sud

Measure Description: DSM-V based symptoms and diagnoses of alcohol and drug use disorders based on the responses to individual questions using the computer administered version of the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Aged Children ([KSADS-COMP](#)).

ABCD Subdomain: SU Consequence

Number of Variables: 495

Summary Score(s): Yes

Measurement Waves Administered: Annually since 1-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

Reference: Kaufman, J., Kobak, K., Birmaher, B., & de Lacy, N. (2021). KSADS-COMP Perspectives on Child Psychiatric Diagnostic Assessment and Treatment Planning. *Journal of the American Academy of Child and Adolescent Psychiatry*, 60(5), 540–542. [Find here](#)

Nicotine Subjective Response

Release 5.0 Data Table: su_y_nic_eff

Measure Description: Assesses early response to using a nicotine product, including pleasant and unpleasant experiences and asks respondents if they encountered various effects while using a nicotine product for the first time (Pomerleau, Pomerleau, & Namenek, 1998).

ABCD Subdomain: SU Consequence

Number of Variables: 25

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Pomerleau, O. F., Pomerleau, C. S., & Namenek, R. J. (1998). Early experiences with tobacco among women smokers, ex-smokers, and never-smokers. *Addiction* (Abingdon, England), 93(4), 595–599. [Find here](#)

RRodriguez, D., & Audrain-McGovern, J. (2004). Construct validity analysis of the early smoking experience questionnaire for adolescents. *Addictive behaviors*, 29(5), 1053–1057. [Find here](#)

PATH Nicotine Dependence

Release 5.0 Data Table: su_y_nic_dep

Measure Description: Symptom frequency checklist of nicotine-related problems over the past 6 months.

ABCD Subdomain: SU Consequence

Number of Variables: 11

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Pomerleau, O. F., Pomerleau, C. S., & Namenek, R. J. (1998). Early experiences with tobacco among women smokers, ex-smokers, and never-smokers. *Addiction* (Abingdon, England), 93(4), 595–599. [Find here](#)

Prokhorov, A. V., Pallonen, U. E., Fava, J. L., Ding, L., & Niaura, R. (1996). Measuring nicotine dependence among high-risk adolescent smokers. *Addictive behaviors*, 21(1), 117–127. [Find here](#)

Community Risk and Protective Factors (Youth)

Release 5.0 Data Table: su_y_crpf

Measure Description: Perceived access to substances of abuse.

ABCD Subdomain: SU Environment

Number of Variables: 15

Summary Score(s): No

Measurement Waves Administered: Annually since 2-year follow-up

Modifications since initial administration: A definition of neighborhood (~1m mile, 20 min walk) was added.

Notes and special considerations: None

References: Arthur, M. W., Briney, J. S., Hawkins, J. D., Abbott, R. D., Brooke-Weiss, B. L., & Catalano, R. F. (2007). Measuring risk and protection in communities using the Communities That Care Youth Survey. *Evaluation and program planning*, 30(2), 197–211. [Find here](#)

Trentacosta, C. J., Criss, M. M., Shaw, D. S., Lacourse, E., Hyde, L. W., & Dishion, T. J. (2011). Antecedents and outcomes of joint trajectories of mother-son conflict and warmth during middle childhood and adolescence. *Child development*, 82(5), 1676–1690. [Find here](#)

Sibling Use

Release 5.0 Data Table: su_y_sibuse

Measure Description: Sibling use of alcohol, cannabis, tobacco, and other substances.

ABCD Subdomain: SU Environment

Number of Variables: 29

Summary Score(s): No

Measurement Waves Administered: Annually since 3-year follow-up

Modifications since initial administration: Gating was added to reduce confusion about sibling ages.

Notes and special considerations: None

Reference: Samek, D. R., Goodman, R. J., Riley, L., McGue, M., & Iacono, W. G. (2018). The Developmental Unfolding of Sibling Influences on Alcohol Use over Time. *Journal of youth and adolescence*, 47(2), 349–368. [Find here](#)

Substance Use Phone Interview (Mid Year)

Release 5.0 Data Table: su_y_mypi

Measure Description: At mid-year interviews (e.g., 6-month, 18-month follow-ups), youth are asked a series of Yes/No questions over the phone about their substance use over the past 6 months.

ABCD Subdomain: Substance Use

Number of Variables: 124

Summary Score(s): No

Measurement Waves Administered: Annually since 6-month follow-up

Modifications since initial administration: None

Notes and special considerations: None

Reference: Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental cognitive neuroscience*, 32, 80–96. [Find here](#)

For additional information about 1-year to 3-year follow-up substance use methods and baseline to 3-year follow-up substance use base rates, see

Sullivan RM, Wade NE, Wallace AL, Tapert SF, Pelham WE 3rd, Brown SA, Cloak CC, Feldstein Ewing SW, Madden PAF, Martz ME, Ross JM, Kaiver CM, Wirtz HG, Heitzeg MM, Lisdahl KM. Substance use patterns in 9 to 13-year-olds: Longitudinal findings from the Adolescent Brain Cognitive Development (ABCD) study. *Drug Alcohol Depend Rep*. 2022 Dec;5:100120. [Find here](#)

Participant Last Use Survey (Youth PLUS; Day 1/2/3/4)

Release 5.0 Data Table: su_y_plus

Measure Description: Measures recent over-the-counter (OTC) or prescription medications, nicotine, and caffeine use prior to neurocognitive tasks or MRI. May be used to control for withdrawal or acute effects of nicotine, caffeine, OTC or prescription medications.

ABCD Subdomain: Substance Use

Number of Variables: 125

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental cognitive neuroscience*, 32, 80–96. [Find here](#)

Substance Use Interview

Release 5.0 Data Table: su_y_sui

Measure Description: Data from this module will provide information in the following domains:

- **Baseline:**
 - Lifetime patterns of substance use (including total dose in standard units, maximum dose, first use, first regular use) of all major drug categories (alcohol, nicotine [cigarettes, ENDS, smokeless tobacco, cigars, hookah, pipe, nicotine replacement], marijuana [smoked flower, blunts, vaped flower, edibles, vaped concentrates, smoked concentrates, THC-infused alcohol, tinctures, synthetic THC], CBD, other vaped products, cocaine, cathinones, methamphetamine, ecstasy/MDMA, ketamine, GHB, heroin, hallucinogens [others], salvia, psilocybin, steroids, inhalants, prescription depressants/sedatives, prescription opioids, OTC, others & a drop-down menu capturing rare substances of abuse [e.g., kava, kratom]).
 - Low-level use of alcohol, nicotine, cannabis
 - Caffeine use in past 6-months
 - Timeline Followback (TLFB) in past 6-months was collected to measure patterns of use.
- **Follow-up (Longitudinal) Sessions:**
 - Yes/no information about whether they used and whether this was their first use (first use yes/no, age of first use) for each drug category since their last session was collected
 - Low-level use (alcohol, nicotine, marijuana) questionnaires were administered.
 - Caffeine use in the past month.
 - Timeline Followback measured detailed patterns of use for each substance category since last session.

Lifetime patterns & Follow-up Questions (Baseline): Assessment of when a participant first used a drug, first regular (weekly) use, lifetime quantity (in standard doses), maximum dose (standard), last date of use. Follow-up questions about cigarettes, ENDS, cannabis, heroin, methamphetamine, and cocaine are also given to assess for issues related to mode of use, route of administration, and flavoring.

Recent Use Patterns & Follow-up Questions (Follow-up): At follow-up sessions, measures of when a participant used each drug and whether this was their first use (yes/no, and date of first use). Follow-up questions about cigarettes, ENDS, cannabis, heroin, methamphetamine, and cocaine are also given to assess for issues related to mode of use, typical dosage, route of administration, and flavoring.

Alcohol Low Level Use (iSip): Nine questions assess participants' earliest sipping experience (including when, context, what type of alcohol) and whether or not a full drink was consumed (items adapted from a survey developed by Jackson, Barnett, Colby, & Rogers, 2015). Youth only fill out the follow-up questions (beyond number of sips) for their first sipping occasion.

Nicotine Low Level Use: Ten questions assess first low-level experiences with nicotine products including (e.g., first puff of a combustible cigarette or e-cigarette, first dip of smokeless tobacco), type of nicotine product, where and when this occurred, and whether it led to further use (adapted from alcohol sipping measure). Youth only fill out the follow-up questions (beyond number of puffs) for their first use occasion.

Cannabis Low Level Use: Eight questions assess first low-level experiences with cannabis products including initial experiences with cannabis (first puff or taste of marijuana), where they obtained the substance, when these experiences occurred, whether it led to further use and subjective experience of feeling "high" (adapted from alcohol sipping measure). Youth only fill out the follow-up questions (beyond number of puffs/tastes) for their first use occasion.

Caffeine Intake: Measures quantity/frequency of various caffeine beverage use in past 6 months at the baseline administration or past month in follow-up sessions.

ABCD Subdomain: Substance use

Number of Variables: 960

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration:

Due to the significant rise in vaping behaviors in youth, we made changes to *separately* measure vaping versus smoking marijuana (MJ) flower and concentrate at all follow-up points administered after 6/24/20.

- **Changes to the timeline follow back:**

- At the time of these changes, all baseline assessments were completed. Thus, a variable indicating vaped MJ flower use *su_tlfb_vape_mj_fl_use* was added, but coded as zero if the youth reported no MJ puffing/tasting (*tlfb_mj_puff* = 0), if they did report puffing/trying MJ flower, then *su_tlfb_vape_mj_fl_use* is reported as missing at baseline. Similarly, a variable reflecting vaped MJ concentrate *su_tlfb_vape_mj_oils_use* was added, although no youth reported using concentrate at baseline.
- No additional variables regarding vaping were added but are available at follow-up time-points 1-3.
- We *separately* measured vaping versus smoking marijuana (MJ) flower and concentrate (*su_tlfb_mj_use_1* measures smoking MJ flower while *su_tlfb_vape_mj_fl_use* measures vaping MJ flower; *su_tlfb_mj_conc_use_1* measures smoking MJ concentrate while *su_tlfb_vape_mj_oils_use* measures vaping MJ concentrate).
 - Similar changes were made to measure whether this was the youth's first use of these products: *tlfb_mj_first_use*; *su_tlfb_mj_fl_first_use*, *su_tlfb_mj_oils_first_use*, *tlfb_mj_con_first_use*).
 - Vaping/smoking MJ flower and concentrate were noted on the TLFB gating variable (*tlfb_6mo_skip_1*) and measured on TLFB calendar (see [Timeline Followback below](#)). In some cases, data on route of administration for MJ flower (*su_tlfb_past_yr_prim_3_mj_1*) was missing, when that occurred smoked MJ flower data remained the same and vaped MJ flower was coded missing. We *dropped* vaping from route of administration question for smoking MJ concentrate and recoded into *tlfb_6mo_10_concmj_1*.
 - For participants who completed the SU interview **prior to 6/24/20**, their answers were recoded based on their response to original follow-up questions measuring route of administration indicating they typically smoked or vaped their flower or concentrate, and mapped onto the new variables outlined above. Options for cannabinoid content of MJ edibles was also recoded to exclude the CBD-only option (*su_tlfb_past_yr_mj_edible_1*). We also added gating question about whether they vaped anything (gating to new vaping expectancies or motives questionnaires; *xskipout_vape*).
- **Changes to Low Level MJ Use Questionnaire:**
 - The low-level MJ use variable denoting product type (*first_mj_4*) was recoded onto the same scale used for follow-up, which included vaped/smoked MJ flower and oil; however, route of administration was not known for MJ flower at that timepoint, so those responses were kept as smoked flower (coded items 1-2).
 - We added vaping wording (to instructions) and separated out vaping versus smoking MJ flower and concentrate as options for their first experience (*first_mj_4_1*); this was recoded based on route of administration responses, in the cases where route of administration was not available, smoked MJ flower remained coded the same (options 1-2). Additional options for who the MJ belonged to were also added (*first_mj_6_1*; options 13-18).

Notes and special considerations: None

References: Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental cognitive neuroscience*, 32, 80–96. [Find here](#)

Jackson, K. M., Barnett, N. P., Colby, S. M., & Rogers, M. L. (2015). The prospective association between sipping alcohol by the sixth grade and later substance use. *Journal of studies on alcohol and drugs*, 76(2), 212–221. [Find here](#)

Timeline Followback Interview Results

Release 5.0 Data Table: su_y_tlfb

Measure Description:

- **Baseline:**
 - The web-based Timeline Followback (TLFB) interview method is used to obtain specific quantitative estimates of drug use over a period of time using memory cues and a calendar format (Sobell & Sobell, 1996). Detailed patterns over past 6 months were measured.
- **Follow-up (Longitudinal) sessions:**
 - The web-based TLFB calendar interview was used to measure detailed patterns of use (past 12 months) for each substance category (in standard units) and estimated patterns of use for remaining months since the youth's last session.
 - Includes a detailed portion covering the past 12 months and an estimated period ("_est") covering any remaining months since the youth's last research session.
 - Detailed TLFB variables include total standard dose, total days used, max dose (in standard units in a single day), average standard doses on use days, total standard doses on weekend, and last date of use.
 - The estimated period is based on their average monthly pattern and includes total standard doses and substance use days.
 - Cumulative variables ("_cum") for total use days and total dose can be calculated across the detailed and estimated ("_est") variables for total standard dose and use days.
 - Combined marijuana (cannabis) and nicotine use day variables are calculated, summing any modes of cannabis or nicotine use days together into singular variables (for past year detailed portion and estimated periods).
 - Co-use days (marijuana+alcohol, marijuana+nicotine, nicotine+alcohol) were calculated (days where the participant reported use of both substances).
 - Raw variables only appear if TLFB was launched by RA. The "_calc" variables are included with 0's added to replace blank responses (in non-users).
 - NOTE: substance use (see su_y_sui) and patterns are measured in SU Patterns (RedCap) and on the TLFB Calendar (su_y_tlfb); in addition, many youth complete the brief **mid-year interview** (see su_y_mypi). This data could be combined with RedCap SU Patterns (yes/no

use data) and quantity/frequency TLFB data if scientists want to include all possible SU measurement modes over time.

ABCD Subdomain: Substance Use

Number of Variables: 438

Summary Score(s): Yes

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: See notes below.

Notes and special considerations:

- Due to a significant rise in **vaping** behaviors in youth, we made changes to *separately* measure vaping versus smoking marijuana (MJ) flower and concentrate/oil at all follow-up points administered **after 6/24/20**. We added vaped MJ flower (tlfb_cal_scr_vmjf_) and vaped MJ oil (tlfb_cal_scr_vmjo_) variables. If the TLFB calendar was administered prior to these changes, responses were re-coded whenever possible to separately reflect vaping vs. smoking MJ flower or oil based on route of administration responses at that time-point (*su_tlfb_past_yr_prim_3_mj_l*, *tlfb_6mo_10_concmj_l*); if this information was missing, then their answers remained coded as smoked flower or smoked concentrate.
- **We strongly recommend that prior releases of TLFB data be replaced with this release, as errors in prior releases were fixed in the 5.0 release.**
 - Some youth's report of cannabis was not scored on the TLFB in prior releases due to variable labeling error between the individual data files and calculated score algorithm that was discovered and fixed for this release.
 - This release corrected an error discovered (12/22) where repeated substance use events on the TLFB were only recorded once in the individual day-level data files utilized for the calendar scoring; this was corrected in the day-level and calculated data for all waves.
 - Prior sessions that were measured in mg for edibles or MJ concentrates were converted to occasions for consistency across data waves.
 - There is missing TLFB data for some youth participants; some is due to COVID-19 related administration in the home and privacy concerns (see "**Xskipout_session**" for SU interview completion details if they underwent a virtual or hybrid research session); others are missing due to research assistant (RA) error (i.e., youth reported using a drug, but RA did not launch TLFB to measure detailed dose/patterns).
 - Note: some youth have 0's in their individual TLFB summary data, this occurred rarely if an RA launched the TLFB, put in an initial date of use but did not record any standard units (denoted as N/A in day-level data; this occurred rarely when a youth initially reported using, but then denied use).

- **Maximum daily standard unit dose limits** were instituted across all waves to date to reduce outlier events:
 - **Max limit: 96:** alcohol (alc), cigarette (cig), ENDS (ecig), smokeless tobacco (chew), cigar (cg), hookah (hooka), pipes (pipe), nicotine rx replacements (nicrx), cigars, MJ smoked flower (smj), MJ vaped flower (vmjf), blunts (blunt), MJ edibles (emj), smoked MJ oil (dab), vaped MJ oil (vmjo), MJ alcohol drink (mjalc), MJ tincture (mjt), CBD (cbd), synthetic MJ (k2), inhalants.
 - **Max limit 24:** cocaine (coc), cathinones (bthslt), methamphetamine (meth), MDMA (mdma), ketamine (ket), GHB (ghb), opiates/heroin (opi), hallucinogens (hall), psilocybin (shroom), salvia (salvia), steroids (roid), stimulant rx (stimrx), sedative rx (sedrx), opiate rx (opiaterrx), OTC (dxm), other (ot).

References: Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental cognitive neuroscience*, 32, 80–96. [Find here](#)

Sobell, L. C., & Sobell, M. B. (1996). Time Line Follow Back. User s Guide, Toronto. *Addiction Research Foundation*. [Find description here](#)

For additional information about 1-year to 3-year follow-up substance use methods and Baseline to 3-year follow-up substance use base rates, see

Sullivan RM, Wade NE, Wallace AL, Tapert SF, Pelham WE 3rd, Brown SA, Cloak CC, Feldstein Ewing SW, Madden PAF, Martz ME, Ross JM, Kaiver CM, Wirtz HG, Heitzeg MM, Lisdahl KM. Substance use patterns in 9 to 13-year-olds: Longitudinal findings from the Adolescent Brain Cognitive Development (ABCD) study. *Drug Alcohol Depend Rep*. 2022 Dec;5:100120. [Find here](#)

Timeline Followback (TLFB) Raw Data

Description of interview

The description of the Timeline Followback Interview is [here](#). To download these raw data, follow the instructions at the [NDA ABCD page](#).

Details of data in raw data files

Variable Name	Description
id	Participant ID
event	ABCD event (wave) name
date_used	Date of substance use
substance_used	Description of substance

Variable Name	Description
amount_used	Amount used
amount_used_unit	Unit of the amount used
amount_used_approximated	Was use estimated (True/False)

Parent Instruments

KSADS—Alcohol/Drug Use Disorder (Parent)

Release 5.0 Data Table: su_p_ksads_sud

Measure Description: Parent reported on youth DSM-V based symptoms and diagnoses of alcohol and drug use disorders based on the responses to individual questions using the computer administered version of the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Aged Children ([KSADS-COMP](#)).

ABCD Subdomain: SU Consequence

Number of Variables: 495

Summary Score(s): Yes

Measurement Waves Administered: Baseline and annually since 2-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

Reference: Kaufman, J., Kobak, K., Birmaher, B., & de Lacy, N. (2021). KSADS-COMP Perspectives on Child Psychiatric Diagnostic Assessment and Treatment Planning. *Journal of the American Academy of Child and Adolescent Psychiatry*, 60(5), 540–542. [Find here](#)

Community Risk and Protective Factors (Parent)

Release 5.0 Data Table: su_p_crpf

Measure Description: Parent reported perceived access to substances of abuse.

ABCD Subdomain: SU Environment

Number of Variables: 14

Summary Score(s): No

Measurement Waves Administered: Annually since 2-year follow-up

Modifications since initial administration: None

Notes and special considerations: None

References: Arthur, M. W., Briney, J. S., Hawkins, J. D., Abbott, R. D., Brooke-Weiss, B. L., & Catalano, R. F. (2007). Measuring risk and protection in communities using the Communities That Care Youth Survey. *Evaluation and program planning*, 30(2), 197–211. [Find here](#)

Trentacosta, C. J., Criss, M. M., Shaw, D. S., Lacourse, E., Hyde, L. W., & Dishion, T. J. (2011). Antecedents and outcomes of joint trajectories of mother-son conflict and warmth during middle childhood and adolescence. *Child development*, 82(5), 1676–1690. [Find here](#)

Substance Use Density, Storage, and Exposure

Release 5.0 Data Table: su_p_dse

Measure Description: Parent reported inventory that measures three household substance use issues: household density, second-hand exposure, and storage. Household density was developed by the ABCD Substance Use workgroup. The survey is based on semi-structured household substance use interviews. It measures household substance use density (i.e., number of adults or youth who use each substance) in up to three households where the youth spends regular time. Second-hand cigarette, electronic nicotine delivery systems (ENDS) or smoked cannabis exposure in these households is also measured (modified from PhenX [Current Environmental Tobacco Exposure](#) assessing total days and hours per day in a typical week for each substance. It also asks parents how each household stores alcohol and drugs (visible/unlocked, hidden/unlocked, or locked) (Bartels et al, 2016; Frieze, Grube & Moore, 2012).

ABCD Subdomain: SU Environment

Number of Variables: 248

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

References: Bartels, K., Mayes, L. M., Dingmann, C., Bullard, K. J., Hopfer, C. J., & Binswanger, I. A. (2016). Opioid Use and Storage Patterns by Patients after Hospital Discharge following Surgery. *PLoS one*, 11(1), e0147972. [Find here](#)

Frieze, B., Grube, J. W., & Moore, R. S. (2012). How parents of adolescents store and monitor alcohol in the home. *The journal of primary prevention*, 33(2-3), 79–83. [Find here](#)

Parental Rules on Substance Use

Release 5.0 Data Table: su_p_pr

Measure Description: Parental substance use approval and rules for youth.

ABCD Subdomain: SU Environment

Number of Variables: 14

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: Rules about ENDS use were added at the 3-year follow-up.

Notes and special considerations: None

References: Dishion, T.J., Kavanagh, K., 2003. Intervening in Adolescent Problem Behavior: A Family-centered Approach. The Guilford Press, New York, NY. [Find here](#)

Dishion, T. J., Nelson, S. E., & Kavanagh, K. (2003). The family check-up with high-risk young adolescents: Preventing early-onset substance use by parent monitoring. *Behavior Therapy*, 34(4), 553-571. [Find here](#)

Jackson, K. M., Barnett, N. P., Colby, S. M., & Rogers, M. L. (2015). The prospective association between sipping alcohol by the sixth grade and later substance use. *Journal of studies on alcohol and drugs*, 76(2), 212-221. [Find here](#)

Jackson, K. M., Roberts, M. E., Colby, S. M., Barnett, N. P., Abar, C. C., & Merrill, J. E. (2014). Willingness to drink as a function of peer offers and peer norms in early adolescence. *Journal of studies on alcohol and drugs*, 75(3), 404-414. [Find here](#)

Participant Last Use Survey (Parent PLUS; Day 1/2/3/4)

Release 5.0 Data Table: su_p_plus

Measure Description: Parent reported measures of recent over-the-counter (OTC) and prescription medications, nicotine, and caffeine use prior to neurocognitive tasks or MRI. May be used to control for withdrawal or acute effects of nicotine, caffeine, OTC or prescription medications.

ABCD Subdomain: Substance Use

Number of Variables: 89

Summary Score(s): No

Measurement Waves Administered: Annually since baseline

Modifications since initial administration: None

Notes and special considerations: None

Reference: Lisdahl, K. M., Sher, K. J., Conway, K. P., Gonzalez, R., Feldstein Ewing, S. W., Nixon, S. J., Tapert, S., Bartsch, H., Goldstein, R. Z., & Heitzeg, M. (2018). Adolescent brain cognitive development (ABCD) study: Overview of substance use assessment methods. *Developmental cognitive neuroscience*, 32, 80–96. [Find here](#)

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