The Future of Families* and Child Wellbeing Study
Daily Sleep Actigraphy and Diary Survey Data

Year 15 Follow-Up Wave

Public Use Version

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*The Year 15 data were collected when the study name was the Fragile Families and Child Wellbeing Study.

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ACTIGRAPHY AND DIARY FILE OVERVIEW

The Future of Families and Child Wellbeing Study (FFCWS) Daily Sleep Actigraphy and Diary Survey dataset contains daily level actigraphy merged with daily level diary survey measures across approximately one week of data collection at Year 15. At Year 15, a randomly selected sub-sample of *N* = 1,090 participating in Year 15 home visits was asked to wear an accelerometer on their non-dominant wrist for seven consecutive days to track their sleep and concurrently complete a survey hosted at Qualtrics.com at approximately 19:00 (7:00 PM) each night, with *N* = 1,049 assenting.

The participants were instructed to wear the actigraphy watch all the time, day or night, except when the watch could be damaged (participating in contact sports or exposed to extreme temperatures). The watch is water resistant, but participants were asked to take the device off while bathing or swimming.

The daily diary queried information regarding last night's sleep and that day's behaviors and mood. The publicly released data includes a selection of these variables; specifically, school attendance and timing; time spent using media, reading, or doing homework; mood; and breakfast and caffeine consumption. The questions are meant to refer to the period between last night's bedtime and the start of that day's diary completion.

Daily actigraphy sleep variables in the current data set are present only for the *n* = 923 participants (across a total of *n* = 5,491 daily actigraphy observations) who provided at least one valid day of sleep actigraphy. Variables are missing for the remaining *n* = 3,975 of the original *N* = 4,898 families enrolled in the Future of Families study.

Daily diary variables in the current dataset are present only for the *n* = 896 participants (across a total of *n* = 5,009 daily diary observations) who provided at least one unique entry in which they answered at least one of the questions included in the public release. Variables are missing for all of these questions for *n* = 4002 of the original *N* = 4898 families enrolled in the FFCWS (missing for *n* = 153 of the assenting sub-sample).

Daily actigraphy and diary data were collected separately. The two datasets were merged by the family identifier *idnum* and nighttime sleep wake date (in the actigraphy data, wake date was recorded by the actigraphy watch; in the diary data, wake date was estimated based on the diary entry start date and clock time). A valid merge between a night of actigraphy data and the next day's diary entry is indicated as *a6_k6sd_valid_merge* = 1. If *a6_k6sd_valid_merge* = 0, no merge occurred for that row, and only actigraphy *or* diary data are present for that row. The variables *a6_actigraphy* and c*k6sd_diary* indicate whether actigraphy or diary data are present for that row (value equal to 1 indicates data are present for that data type). When both *a6_actigraphy* and c*k6sd_diary* are equal to 1, *a6_k6sd_valid_merge* will be equal to 1. When either *a6_actigraphy* or c*k6sd_diary* is equal to 0, all variables for that data type will be missing (blank), and *a6_ k6sd_valid_merge* will be equal to 0. The merged dataset has *n* = 995 idnum across 6,926 rows total.

Please see the corresponding merged dataset and documentation containing average-level sleep actigraphy data for more information on sampling and excluded participants for the daily actigraphy. Please also see the corresponding diary survey codebook in the appendix of this document containing each question included in the public release. The data and documentation are located on the Future of Families website. Users are encouraged to see prior publications

using these data for further details on methods and analyses (references at end of this document).

FILE LAYOUT

The file contains 6,926 daily observations (i.e., rows; one per valid actigraphy day/diary entry) and is sorted by the family identifier *idnum* and consecutive day count variables.

VARIABLE NAMING CONVENTION

The first two or four characters of most variables contain the variable prefix “a6” or "k6sd" to indicate these are actigraphy or diary variables from the sixth wave of data collection (Year 15). The remaining characters indicate the type of variable measure, which include: whether an actigraphy recording and/or diary entry is present; day number, time, day of week, and duration variables, either 24-hour level measures or nighttime-only measures (for actigraphy data); flag variables (for diary data); whether the entire diary entry was completed (for diary data); and the answers to the questions posed to the participants on the daily diary (for diary data). Variables beginning with "ck6sd" are constructed paradata variables that provide additional information about the diary survey data.

Only the family identifier *idnum* does not have this prefix, and the actigraphy-diary merge indicator variable *a6_k6sd_valid_merge* has both prefixes.

Variable definitions are written out fully in the variable label in Stata and detailed in the variable definitions in the "Detailed description of variable categories" and "Data Dictionary" sections of this document. Below are some of the most common or crucial variable abbreviations.

	Position	Character	Indicates
Actigraphy data	1	a	Actigraphy variable
	2	6	Sixth wave (Year 15)
	8-18	mins	Variable unit is in minutes
	17-19	dec	Decimal time
	20-22	_c	Decimal time is midnight-centered (e.g., midnight is 0, 1 AM is 1)
Daily diary data	1	k	Focal child responded
	2	6	Sixth wave (Year 15)
	3-4	sd	Diary variable
	5-7	_q#	Question number posed to participant on diary
	17-18	_mod	Variable has been modified
	17-25	_flag	Flag variable

DAY OF WEEK/TIME VARIABLES

Actigraphy

Several day-of-week and time variables in this data set contain information indicating the exact 24-hour period from which actigraphic day-level variables were calculated (*a6_starttime, a6_endtime;* see second paragraph in “Scoring methods” for information on 24-hour cut-point),

as well as the timing of when the participant's nighttime sleep interval began and ended (*a6_nightslpstarttime, a6_nightslp_endtime*). Invalid days (see section "Data methods >> Actigraphy >> Valid actigraphic days") are not included in this data set, but day count variables (*a6_consecday_count, a6_validday_count*) can be used to determine consecutive days in the data set.

Diary

Several day-of-week and time variables in this data set contain information indicating the day and clock time the diary entry was started and completed (*k6sd_diary_startday, k6sd_diary_starttime, k6sd_diary_endday, k6sd_diary_endtime*) and the estimated wake day of that entry (*k6sd_wake_day*). Potential duplicate entries (identified based on diary entry start date and clock time) are flagged as *k6sd_potential_duplicate_flag* = 1, and researchers may consider excluding these cases from their analyses. Invalid diary entries (see section "Data methods >> Diary >> Valid entries") are not included in this data set, but *k6sd_consecwake_date_count* can be used to determine consecutive days in the data set.

MISSING DATA CODES

Unlike other FFCWS data and documentation, where missing data were given negative values and labels, missing data values in the sleep actigraphy and diary survey data set are represented in the data as "." to avoid confusion due to some variables containing true negative values, such as midnight-centered sleep timing (e.g., *a6_nightslp_start_dec_c*).

If *a6_actigraphy* is 0, all actigraphy data will be missing for that row; if *d6_diary* is 0, all diary data will be missing for that row.

Actigraphy

Where *a6_actigraphy* = 1, there are only 2 daily rows that have missing values for some actigraphy variables (variables 3 – 28) because the participant did not have any scored sleep periods during their 24-hour day (all-nighters). These unique days can be filtered by selecting observations where *a6_allnighter* = 1.

Diary

Where ck6sd_*diary* = 1, missing values may be present for any variables unanswered by the participant, or for flags based on questions posed to participant that were unanswered (e.g., ck6sd_*beginhour_mod_flag* will be blank if k6sd_*q2*is blank).

DATA METHODS

Actigraphy

Actigraphy device, software, and initial processing

Sleep actigraphy data were collected at 30-second epochs with a wrist-worn accelerometer (Actiwatch Spectrum; Philips-Respironics, Murrysville, PA) worn on a participant's non-dominant wrist, all day and night, for about one week. Data collection occurred from 2014 to 2016 and during all months of the year, including summer months. Following the study period, the devices were mailed by the participant to a data coordinating center (Westat). Staff at Westat downloaded the actigraphy recording from each device using Philips Actiware software version 6.0.4 and shared with staff in the Sleep, Health, and Society Collaboratory (SHSC) at Penn State via Secure File Transfer Protocol (SFTP). Staff in the SHSC exported the 30-second epoch data from Actiware 6.0.4 to CSV files in preparation for scoring. The medium sensitivity wake threshold option in the software (40 counts per minute) was selected in calculating sleep variables.

Scoring methods

At least two independent, trained scorers reviewed and visually scored each recording using a standard validated algorithm (see 2013 Marino et al. Sleep; DOI: 10.5665/sleep.3142) to determine sleep and wake in set intervals, performed in a graphical user interface (AMBER 1.0, release version 04/19/2017). Scorers determined cut-point times, validity of days, and set sleep intervals, without using information from a sleep diary.

The cut-point selected for each participant recording determines the "start" and "end" of a 24-hour day. The preferred cut-point is noon for each recording; however, the cut-point can be shifted (as close to noon as possible) to select a time that intersects the minimum number of sleep periods and off-wrist periods for a given recording. Variables *a6_starttime* and *a6_endtime* indicate the cut-point time for each day and are the same across days within the same participant. Scorers determined sleep intervals using a decrease in activity levels and the aid of light levels for sleep onset and sleep offset. A nighttime sleep interval was split into two intervals (night sleep and nap) if there was an awakening ≥ 1 hour during this interval. Sleep intervals were not scored if the duration of an interval was less than 30 minutes; therefore, any nap or nighttime sleep duration must be greater or equal to 30 minutes.

After individual scoring was completed, the scorers adjudicated each recording for interrater agreement by verifying number of valid days, cut-point, number of sleep intervals (night sleep and naps), and differences greater than 15 minutes in duration and wake after sleep onset (WASO) for each sleep interval.

Valid days

The accelerometer had an on-wrist detection feature that allowed scorers to view when participants were not wearing the device. A sleep actigraphy day was determined invalid and no sleep interval was set if there were ≥ 4 total hours of off-wrist time, with the exception of the first and last day (device should be worn at least 2 hours before sleep onset on the first day), constant false activity due to battery failure, or an off-wrist period of ≥ 60 minutes within 10 minutes of the scored beginning or end of the night sleep period for that day. Participants with at least 1 valid day (n = 923 actigraphy rows) are included in this file, and invalid days are not included. For analyses, we recommend to use data for participants who have at least 3 valid days. A greater number of valid days for an individual provides better mean estimates of that individual's regular sleep patterns. However, each study may wish to consider appropriate sensitivity analyses to justify any specific cut-off choices.

Variable categories

Variable 3 (*a6_actigraphy*) indicates that the row contains actigraphy data.

Variables 4 (*a6_consecinterval_count*) to 13 (*a6_allnighter*) reflect daily level consecutive recording day count and valid day count, time, day of week, duration of day and minutes of off-wrist, and an all-nighter indicator. These variables are generally used to indicate the day-level structure for each participant or acknowledge the day of week (weekends vs. weekdays).

The remaining variables 14 (*a6_nightslp_startday*) to 28 (*a6_nap_n*) encompass sleep measures calculated from the nighttime sleep interval, nap intervals, or a combination of both (sleep measures calculated across the 24-hour day). The nighttime sleep interval duration was calculated as the number of minutes between sleep onset and sleep offset during the sleep interval, which was defined as the sleep interval with the longest duration between the hours of 10PM and 8AM in a 24-hour cut-point day. All other sleep intervals within the 24-hour cut-point

day were considered naps and were not included in the nighttime sleep variable measures. The nap variables are *a6_nap_mins* and *a6_nap_n*. The 24-hour sleep variables (which include naps) are *a6_dailysleepdur_mins* and *a6_dailytst_mins*.

Diary

Valid entries

Diary entries that were submitted by the field interviewer when teaching the participant how to use the diary were excluded. Incomplete diary entries submitted near the same time a complete diary entry was submitted were also excluded. Additionally, cases for which the participant did not answer any of the questions included in the public release were excluded.

Variable categories

Variable 29 (*k6sd_diary*) indicates that the row contains diary data.

Variable 30 (c*k6sd_finished*) indicates if the participant completed the entire diary entry.

Variables 31 (c*k6sd_consecwake_date_count*) to 32 (c*k6sd_entry_count*) and 35 (c*k6sd_diary_startday*) to 39 (c*k6sd_wake_day*) reflect consecutive wake date count and diary entry count, diary entry day of week (start and end), time, and estimated wake day of week.

Variables 33 (c*k6sd_potential_duplicate_flag*) to 34 (c*k6sd_two_watches_flag*) and 40 (*k6sd_time_zone_acti_flag*) are flag variables alerting users that the case has some unique characteristic (e.g., the time zone was assigned based on the actigraphy watch).

The next 25 variables, 41 (*k6sd_q1*) to 65 (*k6sd_q22*), are answers to the questions posed to participants, except 43 (c*k6sd_beginhour_mod_flag*), 45 (c*k6sd_beginmin_mod_flag*), and 47 (c*k6sd_beginampm_mod_flag*). These three variables indicate the variable immediately prior, originally answered by the participant, has been modified for that specific case to clean errors (e.g., an "80" for an hour has been changed to an "8").

*Note that for all diary variables with "0" and "1" values (*finished,* all flags, and yes/no questions on the questionnaire portion), 0 indicates "no" and 1 indicates "yes."

DETAILED DESCRIPTION OF VARIABLE CATEGORIES

All variables fall into 1 of 14 categories detailed in this section. Exact variable names are listed below each category.

1. Actigraphy-diary valid merge
    - Variable: *a6_k6sd_valid_merge*
    - A value of *a6_k6sd_valid_merge* = 1 (vs 0, no merge) indicates that there is both nighttime actigraphy and a corresponding next-day diary entry for that row. A value of 0 indicates that there is either actigraphy *or* diary data for that row.
2. Days and counts
    - ACTIGRAPHY
        - Variables: *a6_actigraphy, a6_consecinterval_count, a6_consecwake_date_count, a6_validinterval_count*
        - There are 5,491 valid actigraphy days and each of these days can be filtered by selecting *a6_actigraphy* = 1. Variable *a6_consecinterval_count* is a daily counter variable that indicates the consecutive 24-hour cut-point day number, starting from the first valid day of the recording, and invalid days (skips) are incorporated in the count (e.g., 10/29, 10/31 would be

assigned 1, 3). Variable *a6_consecwake_date_count* is a daily counter that indicates the unique wake date within each participant valid day, and invalid days (skips) are incorporated in the count. Variable *a6_validinterval_count* is a daily counter of only days that are considered to be valid and do not include skips throughout each participant's daily data (e.g., 10/29, 10/31 would be assigned 1, 2).

- DIARY
  - Variables: c*k6sd_diary, ck6sd_consecwake_date_count, ck6sd_entry_count, ck6sd_potential_duplicate_flag, ck6sd_two_watches_flag*
  - There are 5,009 diary entries and each of these days can be filtered by selecting c*k6sd_diary* = 1. Each participant was asked to complete the diary for 7 days. Variable c*k6sd_consecwake_date_count* is a daily counter variable that indicates the wake date of the diary entry, starting from the first wake date, with skipped dates incorporated in the count. Variable c*k6sd_entry_count* is a daily counter corresponding to the number of the diary entry without acknowledging skipped days. Duplicates (potentially to be excluded from analyses) are flagged as c*k6sd_potential_duplicate_flag* = 1 (vs 0) (ck6sd_entry_count is blank for potential duplicates). One participant has a large gap in their c*k6sd_*consecwake_date_count due to receiving the actigraphy watch and completing the daily diary twice (c*k6sd_two_watches_flag* = 1, vs 0).

3. General day specifications
   - ACTIGRAPHY
     - Variables: *a6_startday, a6_starttime, a6_endday, a6_endtime, a6_dailydur_mins, a6_dailyoff_mins, a6_allnighter*
     - Each observation/day in this data set includes the start and end time/day of week descriptive information. In general, each day represents a 24-hour period, starting at the cut-point time selected for each participant recording during scoring. There are typically 1440 minutes/24 hours in each valid day (*a6_dailydur_mins*), unless the device memory became full, the device battery failed, or the data were downloaded during a valid day (typically seen on the last day of the recording). Minutes of off-wrist time (*a6_dailyoff_mins*) is included in the duration of the day. Also included is a day-level indicator that specifies if the day is considered an "all-nighter" (participant did not have any scored sleep intervals during the 24-hour day) - see the "Missing Data Codes" section for more information on all-nighters.
   - DIARY
     - Variables: c*k6sd_diary_startday, ck6sd_diary_starttime, ck6sd_diary_endday, ck6sd_diary_endtime, ck6sd_wake_day, ck6sd_time_zone_acti_flag*
     - Each observation/day in this data set includes the start and end time/day of week of the diary entry. Start time and end time were automatically generated by Qualtrics in UTC time. Participants chose their time zone on the daily diary, which was used to calculate their current time and day of week. The diary start date and time were used to create the variable c*k6sd_wake_day.* Participants who selected their time zone at least once but had one or more blank entries were assigned the mode of their

selected time zones for their blank entries. Two participants did not select their time zone for any entries and were assigned time zones based on their actigraphy watches' time zones (c*k6sd_time_zone_acti_flag* = 1, vs 0).

4. ACTIGRAPHY: Sleep onset timing (nighttime)
    - Variables: *a6_nightslp_startday, a6_nightslp_starttime, a6_nightslp_start_dec_c*
    - Sleep onset was defined as the nighttime sleep duration start time. An algorithm (see 2013 Marino et al. Sleep; DOI: 10.5665/sleep.3142) determined sleep onset as the time of the last 30-second epoch of activity that was >10 counts followed by 5 consecutive epochs that were ≤10 counts. The day of week (Sun-Sat) and time (HH:MM:SS) of sleep onset are included in this data set. Another sleep onset timing variable (*a6_nightslp_start_dec_c*) was constructed as midnight-centered decimal time. For example, the time "0.00" indicates midnight/12:00AM, "-1.20" indicates 10:48PM (or 1.2 hours before midnight), and "2.45" indicates 2:27AM (or 2.45 hours after midnight).
5. ACTIGRAPHY: Sleep offset timing (nighttime)
    - Variables: *a6_nightslp_endday, a6_nightslp_endtime, a6_nightslp_end_dec*
    - Sleep offset was defined as the nighttime sleep duration end time. An algorithm (see 2013 Marino et al. Sleep; DOI: 10.5665/sleep.3142) determined sleep offset as the time of the first 30-second epoch with activity count that was >10 counts preceded by 5 consecutive 30-second epochs ≤ 10 counts. The day of week (Sun-Sat) and time (HH:MM:SS) of sleep offset are included in this data set. Another sleep offset timing variable (*a6_nightslp_end_dec*) was constructed as military decimal time. For example, the time "0.00" indicates midnight/12:00AM, "2.45" indicates 2:27AM, and "14.75" indicates 2:45PM.
6. ACTIGRAPHY: Sleep midpoint timing (nighttime)
    - Variable: *a6_nightslp_mid_dec_c*
    - Sleep midpoint was defined as the time halfway between sleep onset and sleep offset during the nighttime sleep duration interval. The sleep midpoint timing variable was constructed as midnight-centered decimal time.
7. ACTIGRAPHY: Sleep duration (nighttime and 24-hr/daily)
    - Variables: *a6_dailysleepdur_mins, a6_nightsleepdur_mins*
    - Sleep duration was calculated as the total number of minutes between sleep onset and sleep offset in a sleep interval, including any wake time [minutes of wake after sleep onset (WASO); see item 9]. Nighttime sleep duration (*a6_nightsleepdur_mins*) includes the number of minutes between sleep onset and sleep offset during the nighttime sleep interval only. 24-hour/daily sleep duration (*a6_dailysleepdur_mins*) includes the number of minutes in the nighttime sleep interval (*a6_nightsleepdur_mins*) plus any nap minutes (*a6_nap_mins*) within a 24-hr cut-point day.
8. ACTIGRAPHY: Total sleep time (nighttime and 24-hr/daily)
    - Variables: *a6_dailytst_mins, a6_nighttst_mins*
    - Total sleep time (TST) is calculated as the total number of minutes that are considered sleep between sleep onset and sleep offset in a sleep interval and does not include any wake time within that sleep interval (WASO). Nighttime TST (*a6_nighttst_mins)* includes the number of minutes of sleep between sleep onset and sleep offset during the nighttime sleep interval only. 24-hour/daily TST (*a6_dailytst_mins*) includes the number of minutes of sleep in the nighttime sleep interval (*a6_nighttst_mins*) plus any nap minutes (*a6_nap_mins*) within a 24-hr cut-point day.

9. ACTIGRAPHY: Wake after sleep onset - WASO (nighttime)
    - Variable: *a6_restwaso_mins*
    - WASO represents the number of minutes of wake between sleep onset and sleep offset during the nighttime sleep interval. The calculation of this variable is: *a6_restwaso_mins* = *a6_nightsleepdur_mins* − *a6_nighttst_mins*. WASO is typically used as a measure of sleep quality; increased WASO indicates lower sleep quality.
10. ACTIGRAPHY: Sleep maintenance efficiency (nighttime)
    - Variable: *a6_smeff*
    - Sleep maintenance efficiency (*a6_smeff*) was defined as the percentage of minutes (range: 0-100) of total sleep time (*a6_nighttst_mins*) between sleep onset and sleep offset in the nighttime sleep duration interval (*a6_nightsleepdur_mins*). The calculation of this variable is: *a6_smeff* = (*a6_nighttst_mins* / *a6_nightsleepdur_mins*) * 100. Sleep maintenance efficiency is typically used as a measure of sleep quality; higher sleep maintenance efficiency indicates better sleep quality.
11. ACTIGRAPHY: Naps (24-hr/daily)
    - Variables*: a6_nap_mins, a6_nap_n*
    - Nap measures include any sleep intervals in a 24-hr cut-point day that are not the main nighttime sleep interval. The 2 nap variables include the total combined number of minutes per day of nap duration (*a6_nap_mins*) and the number of naps in each day (*a6_nap_n*).
12. DIARY: Entry was finished
    - Variable: c*k6sd_finished*
    - A value of c*k6sd_finished* = 1 (vs 0, unfinished), output in the original Qualtrics file, indicates that the participant completed the entire diary entry.
13. DIARY: Questions answered by participants
    - *Variables*: *k6sd_q1, k6sd_q2 **, k6sd_q3*, k6sd_q4*, k6sd_q5, k6sd_q6, k6sd_q7, k6sd_q8, k6sd_q9, k6sd_q10, k6sd_q11, k6sd_q12, k6sd_q13, k6sd_q14, k6sd_q15, k6sd_q16, k6sd_q17, k6sd_q18, k6sd_q19, k6sd_q20, k6sd_q21, k6sd_q22*
      *Cleaned for potential participant errors; see below.
    - Variables 41 (*k6sd_q1*) to 65 (*k6sd_q22*) are answers to questions posed to the participant in the daily diary, except variables 43 (c*k6sd_beginhour_mod_flag*), 45 (c*k6sd_beginmin_mod_flag*), and 47 (c*k6sd_beginampm_mod_flag*); see below. The appendix contains the diary survey questionnaire (incl., value labels).
14. DIARY: Flags for modified questions
    - Variables: c*k6sd_beginhour_mod_flag, ck6sd_beginmin_mod_flag, ck6sd_beginampm_mod_flag*
    - *k6sd_q2*, *k6sd_q3*, and *k6sd_q4* are variables querying school start hour, minute, and AM/PM, respectively. Due to impossible (e.g., "80" for hour) and missing values, the variables c*k6sd_beginhour_mod, ck6sd_beginmin_mod, and ck6sd_beginampm_mod* were created from these original variables. Variables 43 (c*k6sd_beginhour_mod_flag*), 45 (c*k6sd_beginmin_mod_flag*), and 47 (c*k6sd_beginampm_mod_flag*) are flag variables indicating the case has been modified for data cleaning purposes. Modifications were made on a case-by-case basis, with a flag of 1 indicating the variable was modified (vs 0, unmodified). In several cases, the hour was present, but the minute was missing; *k6sd_q3* was assigned as "0" for these cases. Several cases also were missing AM/PM or

appeared to have AM/PM errors (e.g., reporting going to school at 8:00 PM). For these cases, school start AM/PM was modified such that if *k6sd_q2* was 6 to 11, *k6sd_q4* was assigned as AM; and if *k6sd_q2* was 12 to 3, *k6sd_q4* was assigned as PM. For hours 4 and 5, AM and PM were left unmodified. If any one of the three modified school timing variables were missing, the other two were also set to missing.

The data dictionary (table below) lists the variables and provides a short description for each.

DATA DICTIONARY

Note: Variable names listed in the data dictionary below exclude the "a6_/k6sd_" prefix. Please refer to the "Variable Naming Convention" section for more information.

#	**Variable**	**Variable Description**
1	idnum	Family ID number
2	a6_k6sd_valid_merge	Valid actigraphy night—diary entry merge
ACTIGRAPHY VARIABLES		
3	a6_actigraphy	Actigraphy recording present
4	a6_consecinterval_count	Consecutive interval counter
5	a6_consecwake_date_count	Consecutive wake date counter
6	a6_validinterval_count	Valid interval counter
7	a6_startday	Daily start day of week
8	a6_starttime	Daily start time (HH:MM:SS)
9	a6_endday	Daily end day of week
10	a6_endtime	Daily end time (HH:MM:SS)
11	a6_dailydur_mins	Daily duration in min
12	a6_dailyoff_mins	Daily off-wrist duration in min
13	a6_allnighter	All-Nighter
14	a6_nightslp_startday	Night sleep start day of week
15	a6_nightslp_starttime	Night sleep start time (HH:MM:SS)
16	a6_nightslp_start_dec_c	Night sleep start decimal midnight-centered time
17	a6_nightslp_endday	Night sleep end day of week
18	a6_nightslp_endtime	Night sleep end time (HH:MM:SS)
19	a6_nightslp_end_dec	Night sleep end decimal time
20	a6_nightslp_mid_dec_c	Night sleep midpoint decimal midnight-centered time
21	a6_dailysleepdur_mins	Daily (24h) sleep duration in min (includes WASO)
22	a6_nightsleepdur_mins	Night sleep duration in min (includes WASO)
23	a6_dailytst_mins	Daily (24h) total sleep time in min
24	a6_nighttst_mins	Night total sleep time in min
25	a6_restwaso_mins	Night WASO in min
26	a6_smeff	Night sleep maintenance efficiency in percent
27	a6_nap_mins	Daily nap duration in min (includes WASO)
28	a6_nap_n	Num of naps per day

DIARY VARIABLES		
29	ck6sd_diary	Entry present
30	ck6sd_finished	Entry finished
31	ck6sd_consecwake_date_count	Consecutive wake date counter
32	ck6sd_entry_count	Entry counter
33	ck6sd_potential_duplicate_flag	Flag: Entry is potentially a duplicate
34	ck6sd_two_watches_flag	Flag: Two watches were provided to participant
35	ck6sd_diary_startday	Entry start day of week (Sun-Sat)
36	ck6sd_diary_starttime	Entry start time (HH:MM:SS)
37	ck6sd_diary_endday	Entry end day of week (Sun-Sat)
38	ck6sd_diary_endtime	Entry end time (HH:MM:SS)
39	ck6sd_wake_day	Entry wake day of week (Sun-Sat), estimated from entry start date/time
40	ck6sd_time_zone_acti_flag	Flag: Time zone was assigned based on actigraphy watch time zone
41	k6sd_q1	Question: Did you go to school?
42	k6sd_q2	Question: Hour: What time did your school day begin? (modified)
43	ck6sd_beginhour_mod_flag	Flag: Modified began school hour
44	k6sd_q3	Question: Minute: What time did your school day begin? (modified)
45	ck6sd_beginmin_mod_flag	Flag: Modified began school minute
46	k6sd_q4	Question: AM/PM: What time did your school day begin? (modified)
47	ck6sd_beginampm_mod_flag	Flag: Modified began school AM/PM
48	k6sd_q5	Question: Communicating with friends by email, instant messaging, texting on your phone, or through social media sites, such as Facebook or Twitter (time during day)
49	k6sd_q6	Question: Playing games on the computer, TV, or a handheld device (time during day)
50	k6sd_q7	Question: Visiting websites or shopping on the internet (time during day)
51	k6sd_q8	Question: Watching TV, videos, and movies (on any device) (time during day)
52	k6sd_q9	Question: Reading a book, e-book, or magazine for fun (time during day)
53	k6sd_q10	Question: Watch TV or movies (hour before bed)
54	k6sd_q11	Question: Read or do homework (hour before bed)
55	k6sd_q12	Question: Talk, text, or play games on a phone, computer, or tablet (hour before bed)
56	k6sd_q13	Question: About how many text messages did you send and/or receive on your cell phone?
57	k6sd_q14	Question: Angry: mark how you felt that day
58	k6sd_q15	Question: Bored: mark how you felt that day
59	k6sd_q16	Question: Lonely: mark how you felt that day

60	k6sd_q17	Question: Happy: mark how you felt that day
61	k6sd_q18	Question: Excited: mark how you felt that day
62	k6sd_q19	Question: Did you eat breakfast?
63	k6sd_q20	Question: Coffee or tea (iced or hot): number of 8-oz caffeinated beverages
64	k6sd_q21	Question: Caffeinated Soda (such as Coca-cola, Pepsi, Mountain Dew): number of 8-oz caffeinated beverages
65	k6sd_q22	Question: Energy Drinks (such as Red Bull, Monster, 5-hour Energy, RockStar, Full Throttle, Amp, etc.): number of 8-oz caffeinated beverages

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APPENDIX (DIARY SURVEY QUESTIONNARE)

Daily Media Diary - November 2013

Instructions: Complete the entire questionnaire **each night after 7pm and before going to sleep for all 7 days of the week**. The questions in the diary ask about last night through today. - **If you don't have access to the internet at home**, please complete the questionnaire at **school** or at your **local library**. - **Please let us know if you don't understand something** or if you have any other questions or comments. To do so, please use the open text response at the end of your Daily Diary or via the link at the bottom of the page at **http://teensinmotion.org/**.

- If you have trouble logging in, please call the study's toll-free number: 1-888-312-2295.

Q1 Did you go to school?

- ❍ Yes (1)
- ❍ No (0)

What time did your school day begin?

	Time		Q4 AM/PM
	Q2 Hour	Q3 Minute	
My school day began at:			▼ AM (1); PM (2)

About how many hours today did you spend (more than one activity at once is okay):

Q5 Communicating with friends by email, instant messaging, texting on your phone, or through social media sites, such as Facebook or Twitter?	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more hours (5)
Q6 Playing games on the computer, TV, or a handheld device?	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more hours (5)
Q7 Visiting websites or shopping on the internet?	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more hours (5)
Q8 Watching TV, videos, and movies (on any device)?	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more hours (5)
Q9 Reading a book, e-book, or magazine for fun?	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more hours (5)

Did you do any of the following activities in <u>the hour before</u> you went to bed?

	Yes (1)	No (0)
Q10 Watch TV or movies?	❍	❍
Q11 Read or do homework?	❍	❍
Q12 Talk, text, or play games on a phone, computer, or tablet?	❍	❍

Q13 About how many text messages did you send and/or receive on your cell phone?

- ❍ No texts (0)
- ❍ 1-10 text messages (1)
- ❍ 11-20 (2)
- ❍ 21-50 (3)
- ❍ 51-100 (4)
- ❍ 101-200 (5)
- ❍ Don't have a phone (9)

This list describes feelings or experiences. Mark the selection that best describes how you felt during that day.

Q14 Angry/Mad	▼ Very slightly or not at all (1); A little (2); Moderately; (3); Quite a bit (4); Extremely (5)
Q15 Bored	▼ Very slightly or not at all (1); A little (2); Moderately; (3); Quite a bit (4); Extremely (5)
Q16 Lonely	▼ Very slightly or not at all (1); A little (2); Moderately; (3); Quite a bit (4); Extremely (5)
Q17 Happy	▼ Very slightly or not at all (1); A little (2); Moderately; (3); Quite a bit (4); Extremely (5)
Q18 Excited	▼ Very slightly or not at all (1); A little (2); Moderately; (3); Quite a bit (4); Extremely (5)

Q19 Did you eat breakfast?

- ❍ Yes (1)
- ❍ No (0)

How many caffeinated beverages (such as coffee, soda, energy drinks) did you have? One beverage is about 8 ounces.

Q20 Coffee or tea (iced or hot)	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more (5)
Q21 Caffeinated Soda (such as Coca-cola, Pepsi, Mountain Dew)	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more (5)
Q22 Energy Drinks (such as Red Bull, Monster, 5-hour Energy, RockStar, Full Throttle, Amp, etc.)	▼ 0 (0); 1 (1); 2 (2); 3 (3); 4 (4); 5 or more (5)