**CHAMPS Data Coding**

The CHAMPS questionnaire (Stewart et al., 2001) is a self-report activity questionnaire that asks about a subject’s engagement in physical, cognitive, and social activities. This ‘CHAMPS Data Coding’ document describes the steps that need to be taken in order to code individual CHAMPS variables into summary measures reflecting three categories of engagement: (1) physical activity (separately for low and moderate-high intensity), (2) cognitive activity, and (3) social activity. The categorization of CHAMPS items is shown in Table 1, below.

**Table 1. Categories of CHAMPS activity variables.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable** | **Variable Label** | **Category** | **CHAMPS MET** | **Intensity** |
| **B11110** | Play golf (riding a cart) | Physical | 2.0 | low |
| **B11120** | Light work around the house | Physical | 2.5 | low |
| **B11122** | Light gardening | Physical | 2.25 | low |
| **B11127** | Walk to do errands | Physical | 2.5 | low |
| **B11128** | Walk leisurely | Physical | 2.5 | low |
| **B11134** | Stretching or flexibility exercises | Physical | 2.0 | low |
| **B11135** | Yoga or Tai-chi | Physical | 2.0 | low |
| **B11139** | General conditioning exercises | Physical | 2.5 | low |
| **B11107** | Dance | Physical | 4.5 | high |
| **B11109** | Play golf (carrying or pulling equipment) | Physical | 3.0 | high |
| **B11114** | Play singles tennis | Physical | 6.0 | high |
| **B11115** | Play doubles tennis | Physical | 4.0 | high |
| **B11116** | Skate | Physical | 4.5 | high |
| **B11119** | Heavy work around the house | Physical | 3.0 | high |
| **B11121** | Heavy gardening | Physical | 4.0 | high |
| **B11123** | Work on machinery | Physical | 3.0 | high |
| **B11124** | Jog or run | Physical | 7.0 | high |
| **B11125** | Walk or hike uphill | Physical | 6.0 | high |
| **B11126** | Walk for exercise | Physical | 3.5 | high |
| **B11129** | Ride bicycle or stationary cycle | Physical | 4.0 | high |
| **B11130** | Other aerobic machines | Physical | 5.0 | high |
| **B11131** | Water exercise | Physical | 3.0 | high |
| **B11132** | Swim moderately or fast | Physical | 5.0 | high |
| **B11133** | Swim gently | Physical | 3.0 | high |
| **B11136** | Aerobics or aerobic dancing | Physical | 3.5 | high |
| **B11137** | Moderate to heavy strength training | Physical | 4.5 | high |
| **B11138** | Light strength training | Physical | 3.0 | high |
| **B11140** | Play basketball, soccer, racquetball | Physical | 5.0 | high |
| **B11141\*** | ‘Other’ (self-report) \* | B11141s\_CAT | B11141s\_Mets | B11141s\_CAT |
| **B11106** | Use computer | Cognitive | - | - |
| **B11108** | Do arts or crafts | Cognitive | - | - |
| **B11111** | Attend concert, movie, lecture, sport event | Cognitive | - | - |
| **B11112** | Play cards, bingo, board games w/others | Cognitive | - | - |
| **B11117** | Play musical instrument | Cognitive | - | - |
| **B11118** | Read | Cognitive | - | - |
| **B11101** | Visit with friends and family | Social | - | - |
| **B11102** | Go to senior center | Social | - | - |
| **B11103** | Do volunteer work | Social | - | - |
| **B11104** | Attend church/church activities\*\* | Social | - | - |
| **B11105** | Attend club or group meetings | Social | - | - |
| **B11113** | Shoot pool or billiards | Social | - | - |

\* For the self-reported items (i.e., the B11141 variables), activity categories are coded under the ‘B11141s\_CAT’ variable in the CHAMPS data file (‘Physical-low’, ‘Physical-modhi’, ‘Cognitive’, and ‘Social’). For those items categorized as physical activities, corresponding MET values are coded under the ‘B11141s\_Mets’ variable in the CHAMPS data file.

**Coding of self-reported activities (variable ‘B11141s’)**

*To be completed by the BIOCARD Clinical Core.*

The CHAMPS includes an open-ended question that allows subjects to self-report ‘other’ activities in which they are engaged. Each time the Informatics Core generates a new CHAMPS data file, self-reported responses (variable ‘B11141s’) will need to be coded through a consensus review process, and coded in the CHAMPS data file by creating the following new columns in the data file:

1. B11141s\_CAT: decide whether each B11141s response is “Physical-low”, “Physical-modhi”, “Cognitive”, or “Social”
2. B11141s\_Mets: For the two categories of physical activities, determine whether the B11141s response is similar to one of the physical questionnaire items listed in Table A2 of Stewart et al. (2001).
   1. If similar to one of the Stewart et al. items, enter the “CHAMPS Metabolic Weight” value under ‘B11141s\_Mets’ in the data file
   2. If not similar to one of the Stewart et al. (2001) items, determine whether the B11141s response is similar to one of the items listed in Figure 1–Appendix 1 of Ainsworth et al. (2000). If similar to one of the Ainsworth et al. items, adjust the metabolic weight (METS) to account for the fact that these activities are conducted by *older* adults, and enter the adjusted metabolic weight under ‘B11141s\_Mets’ in the data file
3. B11141s\_SimilarItem:
   1. If the metabolic weight was derived from a Stewart et al. item, enter the corresponding CHAMPS item number(s) under ‘B11141s\_SimilarItem’ in the data file
   2. If the metabolic weight was derived from an Ainsworth et al., enter the corresponding CODE number (e.g., \*\*12345-adj) under ‘B11141s\_SimilarItem’ in the data file

Note: Use the previous data file as a starting point for coding the ‘other’ responses, given a subset of the ‘other’ items included in the newly generated data file will have been previously coded.

**Coding of CHAMPS summary measures**

*To be completed by the BIOCARD Biostatistics Core.*

**I. Coding of activity duration and duration summary measures**

In the CHAMPS data file, duration of activity engagement (hours/week) is coded as an integer (1-6), using the following variable name format: [variable]b (e.g., B11120b). To create duration summary measures for each category of engagement, activities will be re-coded as a NEW duration variable using the formula provided by Stewart et al. (2001), and then combined as described below.

1. Create NEW weighted duration variables in the CHAMPS data file using the formula provided by Stewart et al. (2001). For each of the 41 [variable]b duration variables, create a new duration variable called [variable]b\_dur:
   * If [variable]b is missing then [variable]b\_dur = 0
   * If [variable]b is not missing then do the following:
     + If [variable]b = 1 then [variable]b\_dur = 0.5
     + If [variable]b = 2 then [variable]b\_dur = 1.75
     + If [variable]b = 3 then [variable]b\_dur = 3.75
     + If [variable]b = 4 then [variable]b\_dur = 5.75
     + If [variable]b = 5 then [variable]b\_dur = 7.75
     + If [variable]b = 6 then [variable]b\_dur = 9.75
2. Using the NEW duration variables (i.e., ‘[variable]b\_dur’), create duration summary measures for each category of engagement as follows:
   * For low intensity physical activities:   
     **LOW\_INT\_DUR** = B11110b\_dur + B11120b\_dur + B11122b\_dur + B11127b\_dur + B11128b\_dur + B11134b\_dur + B11135b\_dur + B11139b\_dur + (B11141b\_dur IF B11141s\_CAT = ‘Physical-low’)
   * For moderate-high intensity physical activities:   
     **HIGH\_INT\_DUR** = B11107b\_dur + B11109b\_dur + B11114b\_dur + B11115b\_dur + B11116b\_dur + B11119b\_dur + B11121b\_dur + B11123b\_dur + B11124b\_dur + B11125b\_dur + B11126b\_dur + B11129b\_dur + B11130b\_dur + B11131b\_dur + B11132b\_dur + B11133b\_dur + B11136b\_dur + B11137b\_dur + B11138b\_dur + B11140b\_dur + (B11141b\_dur IF B11141s\_CAT = ‘Physical-modhi’)
   * For cognitive activities:   
     **COG\_DUR** = B11106b\_dur + B11108b\_dur + B11111b\_dur + B11112b\_dur + B11117b\_dur + B11118b\_dur + (B11141b\_dur IF B11141s\_CAT = ‘Cognitive’)
   * For social activities:   
     **SOC\_DUR** = B11101b\_dur + B11102b\_dur + B11103b\_dur + B11104b\_dur + B11105b\_dur + B11113b\_dur + (B11141b\_dur IF B11141s\_CAT = ‘Social’)

**II. Caloric expenditure physical activity summary measures**

CHAMPS physical activity variables can also be converted to measures of caloric expenditure/week using on each variable’s MET (or metabolic weight), as shown in Table 1. Caloric expenditure summary measures (separately for low intensity and moderate-high intensity physical activities) will be created using the formula provided by Stewart et al. (2001), as described below.

* + Convert participants’ weight from pounds to kilograms. The weight variable is called ‘WEIGHTLBSR’ and can be found in the data file “BIOCARD\_Vital\_Signs\_Sensory {date}”. Please use the following formula for the conversion: weight\_kg = ‘WEIGHTLBSR’ x 0.454
  + Subjects with a weight of ‘999’ should be excluded from these calculations, as this value reflects missing data.

1. Separately for each physical activity variable (see Table 1), **and** B11141 **if** B11141s\_CAT = ‘Physical-low’ or ‘Physical-modhi’, calculate caloric expenditure/week using the following formula:
   * [variable]\_cals = [Variable]b\_dur x MET x 3.5 x 60 x (weight\_kg/200)
     + Each variable has its own MET value, as shown in Table 1
     + In total, 29 ‘[variable]\_cals’ variables will be calculated
2. Using the caloric expenditure/week variables (i.e., ‘[variable]\_cals’), create caloric expenditure summary variables, separately for low and moderate-high intensity physical activities, and for all physical activities (regardless of intensity), as follows:
   * For low intensity activities:   
     **LOW\_INT\_CALS** = B11110\_cals + B11120\_cals + B11122\_cals + B11127\_cals + B11128\_cals + B11134\_cals + B11135\_cals + B11139\_cals + (B11141\_cals IF B11141s\_CAT = ‘Physical-low’)
   * For moderate-high intensity physical activities:   
     **HIGH\_INT\_CALS** = B11107\_cals + B11109\_cals + B11114\_cals + B11115\_cals + B11116\_cals + B11119\_cals + B11121\_cals + B11123\_cals + B11124\_cals + B11125\_cals + B11126\_cals + B11129\_cals + B11130\_cals + B11131\_cals + B11132\_cals + B11133\_cals + B11136\_cals + B11137\_cals + B11138\_cals + B11140\_cals + (B11141\_cals IF B11141s\_CAT = ‘Physical-modhi’)
   * For all physical activities, regardless of intensity:   
     **ALL\_INT\_CALS** = B11110\_cals + B11120\_cals + B11122\_cals + B11127\_cals + B11128\_cals + B11134\_cals + B11135\_cals + B11139\_cals + B11107\_cals + B11109\_cals + B11114\_cals + B11115\_cals + B11116\_cals + B11119\_cals + B11121\_cals + B11123\_cals + B11124\_cals + B11125\_cals + B11126\_cals + B11129\_cals + B11130\_cals + B11131\_cals + B11132\_cals + B11133\_cals + B11136\_cals + B11137\_cals + B11138\_cals + B11140\_cals + (B11141\_cals IF B11141s\_CAT = ‘Physical-low’ OR ‘Physical-modhi’)

**III. Frequency summary measures**

In the CHAMPS data file, frequency (times/week) of activity engagement is coded as a self-reported continuous variable using the following variable name format: [variable]a\_freq (e.g., B11120a\_freq). To create frequency summary measures for each category of engagement, activities will be combined as described below.

1. Using the FREQ variables (i.e., [variable]a\_freq), create frequency summary measures for each category of engagement as follows:
   * For low intensity physical activities:   
     **LOW\_INT\_FREQ** = B11110a\_freq + B11120a\_freq + B11122a\_freq + B11127a\_freq + B11128a\_freq + B11134a\_freq + B11135a\_freq + B11139a\_freq + (B11141a\_freq IF B11141s\_CAT = ‘Physical-low’)
   * For moderate-high intensity physical activities:   
     **HIGH\_INT\_FREQ** = B11107a\_freq + B11109a\_freq + B11114a\_freq + B11115a\_freq + B11116a\_freq + B11119a\_freq + B11121a\_freq + B11123a\_freq + B11124a\_freq + B11125a\_freq + B11126a\_freq + B11129a\_freq + B11130a\_freq + B11131a\_freq + B11132a\_freq + B11133a\_freq + B11136a\_freq + B11137a\_freq + B11138a\_freq + B11140a\_freq + (B11141a\_freq IF B11141s\_CAT = ‘Physical-modhi’)
   * For all physical activities, regardless of intensity:  
     **ALL\_INT\_FREQ** = B11110a\_freq + B11120a\_freq + B11122a\_freq + B11127a\_freq + B11128a\_freq + B11134a\_freq + B11135a\_freq + B11139a\_freq + B11107a\_freq + B11109a\_freq + B11114a\_freq + B11115a\_freq + B11116a\_freq + B11119a\_freq + B11121a\_freq + B11123a\_freq + B11124a\_freq + B11125a\_freq + B11126a\_freq + B11129a\_freq + B11130a\_freq + B11131a\_freq + B11132a\_freq + B11133a\_freq + B11136a\_freq + B11137a\_freq + B11138a\_freq + B11140a\_freq + (B11141a\_freq IF B11141s\_CAT = Physical-low’ OR ‘Physical-modhi’)
   * For cognitive activities:   
     **COG\_FREQ** = B11106a\_freq + B11108a\_freq + B11111a\_freq + B11112a\_freq + B11117a\_freq + B11118a\_freq + (B11141a\_freq IF B11141s\_CAT = ‘Cognitive’)
   * For social activities:   
     **SOC\_FREQ** = B11101a\_freq + B11102a\_freq + B11103a\_freq + B11104a\_freq + B11105a\_freq + B11113a\_freq + (B11141a\_freq IF B11141s\_CAT = ‘Social’)

**IV. Total engagement summary measure**

In the CHAMPS data file, activity engagement is coded as a dichotomous (yes/no) variable using the following variable name format: [variable]a (e.g., B11120a). Create a total engagement summary measure, across all categories of engagement, as described below.

1. For each variable listed in Table 1, create a numeric activity engagement variable by recoding the 41 ‘[variable]a’ variables as follows:

* [variable]a\_dicho = 1 if [variable]a = Y, otherwise 0

1. Using the numeric engagement variables (i.e., ‘[variable]a\_dicho’), create a total engagement summary measure as follows:

* **TOT\_ENGAGE** = ∑ (the 41 ‘[variable]a\_dicho’ variables)

Once you have completed the coding, please send a copy of the data file (in csv or xls format) to:

Anja Soldan ([asoldan1@jhmi.edu](mailto:asoldan1@jhmi.edu)) and Corinne Pettigrew (cpettigrew@jhmi.edu).