

# Package ‘BayesSUDPrediction’

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**Type** Package

**Title** Substance Use Disorder (SUD) Risk Prediction Tool

**Version** 0.0.0.9000

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**Description** This package predicts the risk of developing substance use disorder (SUD) in adulthood based on the personalized risk factors measured in adolescent or young adulthood. Currently this package predicts risk for Cannabis use disorder (CUD) only.

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**Depends** R (>= 2.10)

**Imports** dplyr, tidyr, stringr

**RoxygenNote** 7.2.1

**Suggests** testthat,  
knitr,  
rmarkdown

**VignetteBuilder** knitr

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post_data	<i>Posterior distribution used to build the models. It includes information of the posterior distribution of the beta coefficients</i>
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## Description

Posterior distribution used to build the models. It includes information of the posterior distribution of the beta coefficients

**Usage**

```
post_data
```

**Format**

An object of class `data.frame` with 5000 rows and 8 columns.

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pred_cud	<i>Predict the chance of developing cannabis use disorder (CUD) in the adulthood for an adolescent/ young adult cannabis user.</i>
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**Description**

Predict the chance of developing cannabis use disorder (CUD) in the adulthood for an adolescent/ young adult cannabis user.

**Usage**

```
pred_cud(
  data,
  no_of_bf_mjw = "prefix_of_peer_can_use_at_each_wave_variable",
  age = "prefix_of_age_at_each_wave_variable",
  aid = "subject_id",
  gender = "gender_variable",
  csum = "csum_variable",
  isum = "isum_variable",
  nsum = "nsum_variable",
  delinquency = "delquency_mean_variable",
  ace = "ace_scale_variable"
)
```

**Arguments**

data	a data frame that stores all the variables.
no_of_bf_mjw	starting prefix of variables measures the peer cannabis use at each wave. Each variable should start with the same prefix. E.g., if peer cannabis use measured at two time points, then one can name the variables as follows: "peer_1", "peer_2". Ensure that the starting prefix is "peer_".
age	starting prefix of variables measures the age at each wave. Each variable should start with the same prefix. E.g., if age measured at two time points, then one can name the age variables as follows: "age_1", "age_2". Then the starting prefix would be "age_".
aid	subject_id of the participant(s).
gender	gender of the participant(s).
csum	variable measures the conscientiousness scale of the participant(s). A higher value of csum should imply less conscientiousness. csum should be scaled by dividing by its maximum possible value.
isum	variable measures the openness scale of the participant(s). A higher value of isum should imply more openness. isum should be scaled by dividing by its maximum possible value.

nsum	variable measures the neuroticism scale of the participant(s). A higher value of isum should imply more neuroticism. nsum should be scaled by dividing by its maximum possible value.
delinquency	Average delinquency measure of the participant(s) across different waves. First, calculate the delinquency score at each wave and divide by its maximum possible value at that wave. Then calculate the average of these scaled delinquency scores across different waves.
ace	Number of adverse childhood experiences of the participant(s). This number should be scaled by dividing by the total number of adverse childhood experiences.

## References

Rajapaksha, RMDS, Filbey, F, Biswas, S, Choudhary, P (2022). A Bayesian learning model to predict the risk for cannabis use disorder. *Drug Alcohol Depend*, 236:109476.

## Examples

```
#The package requires to create the data frame in a certain format.
#Especially for longitudinal variables: peer cannabis use (no_of_bf_mjw) and delinquency.
#The longitudinal variables should be named using the same prefix.
#All the continuous predictors should be scaled so that those variables lie within [0,1].
#In this example, we assume that the cannabis user has information of peer cannabis use
#for 3 time points (waves) and delinquency for 4 time points (waves).
#Lets assume the data looks like this.

#subject id
id=1

#Peer cannabis use
#Peer cannabis use is a longitudinal predictor, that measured at 3 time points (waves).
#Number of time points (waves) can be different from 3.
#Lets assume that peer cannabis use was measured by the following question.
#peer_cannabis_use: No of friends Out of 3 best friends that use cannabis at least once a month
#Values at each time point (wave) should be scaled by dividing by the total number of friends.
#If the reported number of friends in wave 1 is 1, then the scaled value should be 1/3
peer_w1=0.333
#If the reported number of friends in wave 2 is 2, then the scaled value should be 2/3
peer_w2=0.66
#If the reported number of friends in wave 3 is 3, then the scaled value should be 3/3
peer_w3=1

#Age
#Package also needs the age of the participant(s) at each time point (wave),
#where peer cannabis use was measured.
#age_at_each_time_point
age_w1=14
age_w2=16
age_w3=18

#Delinquency
#Delinquency is a longitudinal predictor, that measured at 4 time points (waves).
#Number of time points (waves) can be different from 4.
#Assume that the delinquency score at each wave is 40, 32, 48 and, 60, respectively.
#Assume that the maximum delinquency score at each wave is 45, 42, 60 and, 72, respectively.
#The delinquency mean can be calculated as follows: First scale the delinquency score at each wave.
delq_w1_scaled= 40/45
```

```
delq_w2_scaled= 32/42
delq_w3_scaled= 48/60
delq_w4_scaled= 60/72
#Then calculate the average delinquency score
#delq_mean= (delq_w1_scaled + delq_w2_scaled + delq_w3_scaled + delq_w4_scaled)/4
delq_mean=0.82

#Gender
#male=1 and female=0
gender=1

#Conscientiousness
#Assume that the conscientiousness score of the participant is 17.
#Assume that the maximum conscientiousness score someone can get is 20. Then csum = 17/20
csum=0.85

#Openness
#Assume that the openness score of the participant is 14.
#Assume that the maximum openness score someone can get is 20. Then isum = 14/20
isum=0.7

#Neuroticism
#Assume that the neuroticism score of the participant is 11.
#Assume that the maximum neuroticism score someone can get is 20. Then nsum = 11/20
nsum=0.55

#Sum of adverse childhood experiences
#Assume that the participant experienced 7 adverse childhood experiences out of 9 experiences.
#Then ace=7/9
ace=0.778

#Create the data frame based on previous information.
data_cud=data.frame(cbind(id,peer_w1,peer_w2,peer_w3,age_w1,age_w2,age_w3,
delq_mean,gender,csum, isum,nsum,ace))

#Apply the function to calculate the CUD risk
pred_cud(data = data_cud,no_of_bf_mjw = "peer_w",age = "age_w", aid = "id",gender =
"gender",csum = "csum",isum = "isum", nsum = "nsum",delinquency = "delq_mean",ace = "ace")
```

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\* **datasets**

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