

# ASSIGNMENT 4

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```
knitr::opts_chunk$set(echo = TRUE)
assn4 <- read.csv(file = "assignment.csv")

## code to create psych_rank vector and add to dataframe

# IMPORTANT: this code assumes that your dataframe is called a4

# create empty vector of zeros called meanness
# with length equivalent to original vector TriPM_M
meanness <- rep(0, length(assn4$TriPM_M))
# overwrite zeros in meanness vector using
# logical operators to determine if TriPM_M is >20
# or <= 20
meanness[assn4$TriPM_M > 15] <- 1
meanness[assn4$TriPM_M <= 15] <- 0

# repeat process for boldness
boldness <- rep(0, length(assn4$TriPM_B))
boldness[assn4$TriPM_B > 23] <- 1
boldness[assn4$TriPM_B <= 23] <- 0

# repeat process for disinhibition
dis <- rep(0, length(assn4$TriPM_D))
dis[assn4$TriPM_D > 24] <- 1
dis[assn4$TriPM_D <= 24] <- 0

# create a 'psych_rank' vector that 'counts'
# the number of traits that are 'high' for each
# individual
psych_rank <- meanness + boldness + dis

# add the psych_rank variable to the a4 dataframe
assn4 <- data.frame(cbind(assn4, psych_rank))
```

## QUESTION 1

**A**

We are going to use a hypothesis test for the study and we are going to focus on Psychopathy rank(psych\_rank) to evaluate whether the same pattern (Canada, Portugal, the UK, and the USA) is consistent for Polish students.

**B**

Null hypothesis( $H_0$ ) =  $p = p_0$

Alternative hypothesis( $H_a$ ) =  $p < p_0$  or  $p > p_0$  or  $p \neq p_0$

The prevalence of psychopathy for Polish students will be larger than 0.045

Let  $p$  the proportion of students in Polish universities whose psych\_rank are 2 or 3.

$H_0$ :  $p = 0.045$

$H_a$ :  $p > 0.045$

## QUESTION 2

### A

We are going to use a hypothesis test for the study and we are going to focus on Psychopathy rank(psych\_rank) to evaluate whether the same pattern (Canada, Portugal, the UK, and the USA) is consistent for Polish students.

### B

Null hypothesis( $H_0$ ) =  $p = p_0$

Alternative hypothesis( $H_a$ ) =  $p < p_0$  or  $p > p_0$  or  $p \neq p_0$

The prevalence of psychopathy for Polish students will be larger than 0.045

Let  $p$  the proportion of students in Polish universities whose psych\_rank are 2 or 3.

$H_0$ :  $p = 0.045$

$H_a$ :  $p > 0.045$

### C

```
table(assn4$psych_rank > 1)
```

```
##  
## FALSE  TRUE  
##   354    36
```

```
length(assn4$psych_rank)
```

```
## [1] 390
```

```
prop.test(x=36,n=390,p=0.045,alternative="greater",correct=TRUE)
```

```
##  
## 1-sample proportions test with continuity correction  
##  
## data: 36 out of 390, null probability 0.045  
## X-squared = 19.224, df = 1, p-value = 5.812e-06  
## alternative hypothesis: true p is greater than 0.045  
## 95 percent confidence interval:  
##  0.06980214 1.00000000  
## sample estimates:  
##           p  
## 0.09230769
```

### D

The proportion of students in Polish universities who demonstrate psychopathic personality traits(95% CI:0.06-0.12) higher than that of the general adult population.(0.045) ( $Z=4.38$ ,  $p=5.812e-06$ ,  $n=390$ )