

#### Context

An experiment on the effects of anti-anxiety medicine on memory recall when being primed with happy or sad memories. The participants were done on novel Islanders whom mimic real-life humans in response to external factors. Data informations given:

- Drugs of interest (known-as) [Dosage 1, 2, 3]:
- A Alprazolam (Xanax, Long-term) [lmg/3mg/5mg]
- T Triazolam (Halcion, Short-term) [0.25mg/0.5mg/0.75mg]
- S- Sugar Tablet (Placebo) [1 tab/2tabs/3tabs]
  - O Dosages follow a l:l ratio to ensure validity
  - O Happy or Sad memories were primed 10 minutes prior to testing
  - O Participants tested every day for I week to mimic addiction
- Participants all genders above 25+ years old to ensure a fully developed pre-frontal cortex, a region responsible for higher level cognition and memory recall.:
- Experiment was executed under the supervision of Mr. Almohalwas at UCLA.
- All aspects of the experiment such as experimental design, data collection and preprocessing was done from myself.

https://www.kaggle.com/steveahn/memory-test-on-drugged-islanders-data

### Inspiration

An experiment on the effects of anti-anxiety medicine on memory recall when being primed with happy or sad memories. The participants were done on novel Islanders whom mimic real-life humans in response to external factors. Data informations given:

- How does anti-anxiety medicine affect you differently by age?
- Is there a level of plateauing in effectiveness of anti-anxiety medicine if so, at what point?
- Effect of anti-anxiety medicine on memory recall?
- Effectiveness of placebos in a test environment?

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**02** Statistical analysis **04** Conclusion







### Data preparation

Import the pandas library, and load the database.

```
import pandas as pd
df=pd.read csv('Islander data.csv')
```

Check some lines in the database to see if the loading was correct.

```
df.sample(10)
```

Evaluate the data types of each column and check for null values

```
df.info()
```





### Statistical analysis

To get a summary of statistical information for numeric data.

df.describe()

Counting Categorical Values to Evaluate Proportions.

df['Drug'].value counts()

df['Happy Sad group'].value counts()

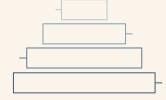


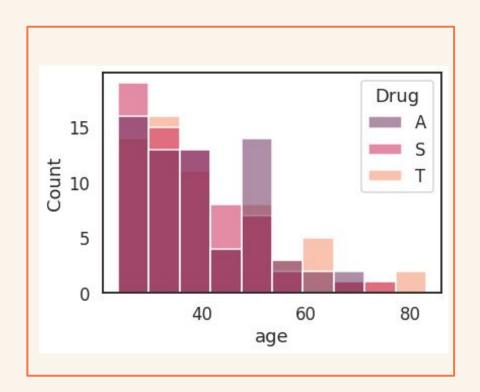


### Graphical analysis

In the following slides, questions will be presented, as well as their answers through graphics.





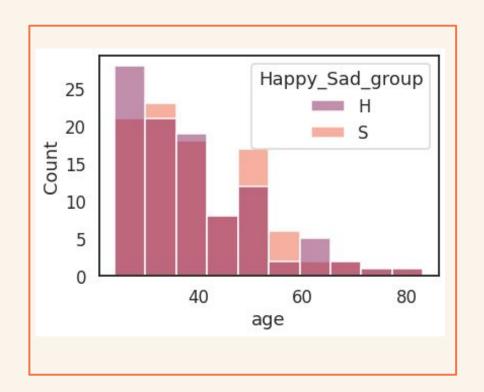


## Is there any predominance of drugs by age?

To answer this question, let's make a bar chart using seaborn.

```
sns.color palette("coolwarm", as cmap=True)
sns.histplot(data=df, x="age",
hue="Drug",palette='rocket')
```

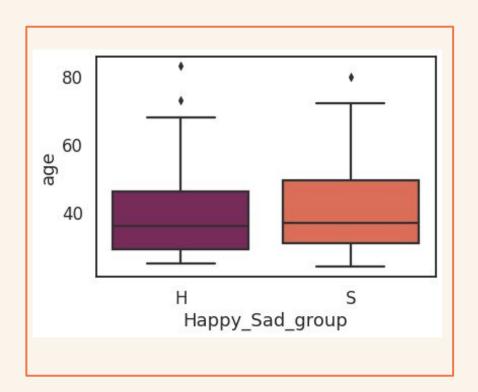
Segmenting by type of drug, we can see that the age distribution is quite similar.



# How is the distribution of happy and sad grouped by age?

```
sns.color palette("coolwarm", as cmap=True)
sns.histplot(data=df, x="age",
hue="Happy Sad group",palette='rocket')
```

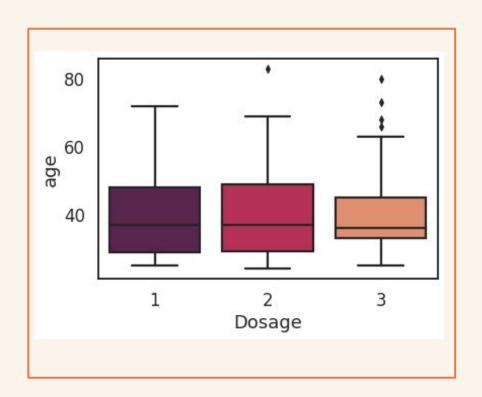
As it is very important for the test to know the type of memory, this analysis was made in order to know if you have any age with some type of predominant memory.



# Is there any predominance in some kind of memory?

```
ax = sns.boxplot(x="Happy Sad group", y="age",
data=df,palette='rocket')
```

Doing the boxplot by age of each group, we see that their distribution is very similar and both medians are around 40 years old.

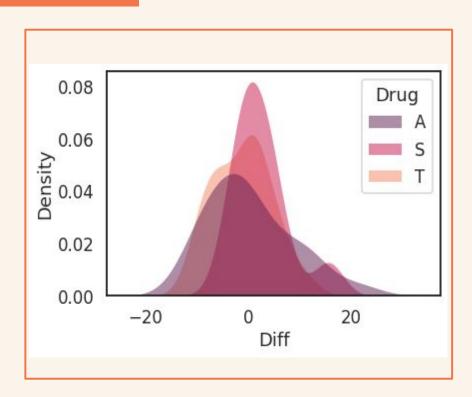


### How was the age distribution by dose?

```
ax = sns.boxplot(x="Dosage", y="age",
data=df,palette='rocket')
```

Doing the boxplot, we can see that the three medians are close to 40 years, however the group submitted to 3 doses is a little smaller than the groups of one and two doses.

#### Dosage =1

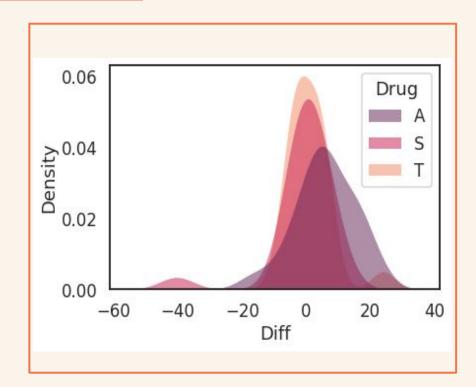


# Does the dosage influence the improvement of memories?

"Diff" is the difference between the score before and after using the drug. Making an evaluation of this score for the different amounts of dosages.

With a single dosage, we cannot say that there is a more effective remedy, since the "Diff" distributions are very similar and have a higher density close to zero.

#### Dosage = 2

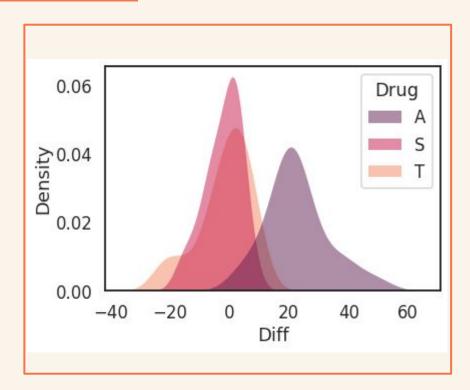


# Does the dosage influence the improvement of memories?

"Diff" is the difference between the score before and after using the drug. Making an evaluation of this score for the different amounts of dosages.

Using two doses, we can see that Triazolam starts to have a better response, since most of its distribution is above zero.

#### Dosage =3



# Does the dosage influence the improvement of memories?

"Diff" is the difference between the score before and after using the drug. Making an evaluation of this score for the different amounts of dosages.

Using three doses, we again observed that Triazolam has a better response, as much of its distribution is above zero, with a higher density at 20.



#### Conclusions

In conclusion we can say that:

We have a well-balanced test base both in terms of age and distribution of happy and sad;

The control group that was given 3 doses of medicine is slightly smaller than the one that was given one or two doses;

Applying a single dose, there are no major differences between drugs and placebo;

As we increase the number of doses, the efficiency of triazolam is getting better and better.



### **Thanks**

Does anyone have any questions or suggestions?



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