IMPACT OF MUSIC ON DECISION MAKING UNDER UNCERTAINIY

Data Analytics Lab Project

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SUMMARY:

The experience of negative or positive moods is ubiquitous in everyday life. Moods shape decisions, but often remain unnoticed in the background. This dissertation systematizes the theory of mood influence and shows how the effects of moods unfold in different domains of decision-making. The multitude of emotion theories is organized in this thesis along the three frameworks. First, content-related theories assume that moods influence the content of thoughts by incorporating new information into the decision-making process. Secondly, process-related theories focus on changes in information processing. Thirdly, regulation-related theories concern the study of the motivation to maintain positive and avoid negative moods.

INTRODUCTION:

Moods in decision research have been ignored for many years, although decisions made in an emotional state are ubiquitous in daily life. The areas of emotion and decision-making research have remained mostly unfamiliar to each other if one considers the coverage of topics in journals and conferences. Whereas decision researchers have designed sophisticated paradigms and constructed cognitive models, emotion researchers have focused on affective states per se, often without applying them to a decision. This work is an attempt to develop an interdisciplinary study that not only connects theories of both fields but also combines paradigms of decision-making and methods of mood manipulation from emotion research.

The influence of mood on decision-making is an important question to study given the pervasiveness of mood in everyday life. Mood does not spur an immediate action, as intense emotions, such as anger and fear, can do, but it changes the way people think (Martin and Clore, 2001). Thus, the effect of mood is less visible but more enduring and complex. In addition, many decisions are made in contexts that elicit intense positive or negative effects. For instance, euphoria on the stock market can create overconfidence and fuel the growth of financial bubbles (Shiller, 2015). On the other hand, mood swings caused by illness or the perception of future risks can bias health-related decisions (Salovey and Birnbaum, 1989). By applying paradigms of decision-making, this work expands knowledge of the mechanisms by which

mood can influence behaviour. The results of this dissertation can be generalized to other situations, which can stimulate the development of new hypotheses. The current state of the field is that no overarching theory explains how moods impact decisions.

The effect of mood can take different paths depending on many factors including the type of decision and cognitive activity that the decision requires. As will be argued in this dissertation, mood can influence the content of thoughts, the way of information processing, and the motivation of mood regulation. Understanding some mechanisms underlying this influence is the goal of this work. Three different decision-making paradigms are at the heart of this thesis: the multi-attribute decision task, the exploration-exploitation trade-off, and the default heuristic. Three empirical studies characterize the influence of positive and negative mood in each of these paradigms.

DATASET:

The dataset has been recorded by performing the experiment on 30 students who agreed to participate and who signed the informed consent form were randomly allocated to one of two groups: the positive mood-induced group by making them to listen their favourite music and the group of students with neutral state of mood.

They have been asked 5 questions each having 2 options (the last 2 questions are based on survivability and mortality) and we gave score based on their response to the questions asked. These scores were recorded and the total score has been generated to each student.

The questions are as follows:

1. Positive prospect (Kahneman & Tversky, 1979)

A: You can win Rs. 25,000 with probability .33

B: You can win Rs. 20,000 with certainty

Rs. 24,000 with probability .66

O with probability .01

2. Positive prospect (Kahneman & Tversky, 1979)

A: You can win Rs. 25,000 with probability .33

O with probability .67

B: You can win Rs. 24,000 with probabilities .33

O with probability .66

3. Negative prospect (Kahneman & Tversky, 1979)

A: You can lose Rs. 40,000 with probability .80

B: You can lose Rs. 30,000 with certainty

O with probability .20

4. Survival frame

A (Surgery): Of 100 people having surgery, 90 live through the post-operative period, 58 are alive at the end of the first year, and 32 are alive at the end of 5 yr.

B (Surgery): Of 100 people having surgery, 10 die during surgery of the post-operative period, 30 die by the end of the first year, and 60 die by the end of 5 yr.

5. Mortality frame

A (Radiation Therapy): Of 100 people having radiation therapy, all live through the treatment, 77 are alive at the end of 1 yr., and 23 are alive at the end of 5 yr.

B (Radiation Therapy): Of 100 people having radiation therapy, none die during treatment, 22 die by the end of 1 yr., & AU: Is 78 die by the end of 5 yr.

```
In [76]: dataset = pd.read_csv("/Users/apple/Desktop/untitled folder/analytics_lab.csv")

In [77]: dataset
```

Out[77]:

	S.no	Stu.Reg.no	Q-1	Q-2	Q-3	Q-4	Q-5	Score	Mood State
0	1	20BCI7150	a	b	b	a	b	77	0
1	2	20BCD7129	a	b	b	b	b	87	1
2	3	20BCE7113	a	a	b	a	b	79	0
3	4	20BCE7114	a	b	a	a	b	82	1
4	5	20BCE7115	a	b	b	a	b	89	1
5	6	20BCE7116	a	b	b	a	b	83	0
6	7	20BCE7117	a	b	a	a	b	84	0
7	8	20BCE7118	a	b	b	a	b	97	1
8	9	20BCE7119	a	b	b	a	b	91	1
9	10	20BCE7120	a	b	b	a	b	79	0
10	11	20BCI7151	a	b	b	a	b	79	0
11	12	20BCD7128	a	b	b	a	b	86	1
12	13	20BCE7213	a	b	a	a	b	71	0
13	14	20BCE7214	a	b	b	b	b	84	1
14	15	20BCE7215	a	b	b	a	b	91	1
15	16	20BCE7216	a	b	b	a	b	81	0
16	17	20BCE7217	a	b	b	b	a	82	0
17	18	20BCE7218	a	b	b	a	b	97	1

17	18	20BCE7218	a	b	b	a	b	97	1
18	19	20BCE7219	a	a	b	a	b	91	1
19	20	20BCE7220	a	a	b	a	b	79	0
20	21	20BCI7153	b	b	b	a	b	77	0
21	22	20BCD7187	a	b	a	a	b	87	1
22	23	20BCE7313	a	b	b	a	b	89	0
23	24	20BCE7314	a	b	b	a	b	80	1
24	25	20BCE7315	b	b	b	a	b	86	1
25	26	20BCE7316	a	b	b	a	b	82	0
26	27	20BCE7317	b	b	b	a	b	84	0
27	28	20BCE7318	a	b	b	a	b	97	1
28	29	20BCE7319	a	a	b	a	b	99	1
29	30	20BCE7320	a	b	b	a	b	70	0

CODE:

```
In [1]: import pandas as pd
        import numpy as np
        import matplotlib.pyplot as plt

In [45]: dataset = pd.read_csv("/Users/apple/Desktop/untitled folder/analytics_lab.csv")
```

Application of Logistic Regression:

```
In [78]: # input
         x = dataset.iloc[:, 7].values
         # output
         y = dataset.iloc[:, 8].values

In [48]: x

Out[48]: array([77, 87, 79, 82, 89, 83, 84, 97, 91, 79])

In [79]: x = x.reshape(-1,1)

In [80]: from sklearn.model_selection import train_test_split
         X_train, X_test, y_train, y_test = train_test_split(x, y, test_size = 0.25, random_state = 0)
```

In [81]:
```
from sklearn.preprocessing import StandardScaler
sc_x = StandardScaler()
X_train = sc_x.fit_transform(X_train)
X_test = sc_x.transform(X_test)

print (X_train[0:5])
```

```
[[ 1.8481294 ]
 [ 0.71871699]
 [-0.12834232]
 [-0.26951887]
 [ 1.00107009]]
```

In [51]:
```
X_train
```

Out[51]:
```
array([[79],
       [87],
       [84],
       [97],
       [82],
       [77],
       [83]])
```

In [82]:
```
from sklearn.linear_model import LogisticRegression
classifier = LogisticRegression(random_state = 0)
classifier.fit(X_train, y_train)
```

Out[82]:
```
LogisticRegression(random_state=0)
```

In [83]:
```
y_pred = classifier.predict(X_test)
```

In [84]:
```
X_test
```

Out[84]:
```
array([[-0.69304852],
       [ 2.1304825 ],
       [ 0.01283423],
       [-0.69304852],
       [ 0.01283423],
       [ 0.29518733],
```

In [85]:
```
from sklearn.metrics import accuracy_score
print ("Accuracy : ", accuracy_score(y_test, y_pred))
```

```
Accuracy :  0.875
```

Confusion Matrix:

In [91]:
```
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(y_test, y_pred)

print ("Confusion Matrix : \n", cm)
```

```
Confusion Matrix :
 [[3 0]
 [1 4]]
```

Conclusion:

We have given 14 points to option A (As it is much riskier to choose for the financial section) and 20 points to the Option B (it is much safer option in the financial section) later for the sections of survivability and mortality frame we have given the same points distribution irrespective of the risk involvement of the options. After completing the experiment, results came out to be 88% of the students who listened to songs irrespective of the gender scored more than 85points. The students who did not listened songs i.e., students who are having neutral state of mind according to the experiment, have scored in the range of 70-85 points respectively.

This states that the people who are in happier mood (after listening to their favourite music) tend to choose more safer option and the people in the neutral state tend to choose the options which included some risk.

References:

https://drsachinandan.com/publication/26.Psychlogical%20reports.pdf

https://www.studocu.com/de-at/document/universitat-graz/demonstrationen-und-ubungen-zur-allgemeinen-psychologie/rowe-hirsh-anderson-2007/17918033