

# Role of Individual Differences in Decision Making

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## Abstract

The human tendency to rely on a certain anchor while making decisions has been well documented in numerous experiments. In our study, we observe the effect of the five personality traits, namely: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism on our decisions in response to anchoring cues. One study had reported the association of the “Openness” trait with the responses while another group had reported the association of the “Extraversion” trait. In our experiment, we presented 26 participants with 4 different anchoring cues and noted their response to a question. Results indicated that people who scored high on Openness to Experience and Agreeableness relied less heavily on the anchor when compared to those who scored less.

## Background

We do not perform complex computations before making a decision but rely on certain shortcuts. These shortcuts, in general, enable us to make quick decisions but sometimes the quickness might result in irrational decisions. These decision making aids or shortcuts are referred to as heuristics and our study explores the properties of the Anchoring heuristic.

Anchoring refers to the tendency of relying heavily on the initial information offered while making decisions. The initial information serves as an anchor for our subsequent decisions.

Decision making is a subjective process to a large extent and individual differences, which includes, personality and intelligence, must play a role in the process. Psychologists have classified personality into five broad categories:-

- Openness to Experience (Curiosity, appreciation for unusual ideas, adventure)
- Conscientiousness (Sincerity, discipline, organization)
- Extraversion (Energy, Sociability)
- Agreeableness (Cooperative, trusting, compassionate)
- Neuroticism (relaxed, stress-free, secure)

The gold standard to measure the five personality parameters is the 240 item NEO-PI-R (Revised NEO Personality Inventory). Despite its accuracy NEO-PI-R is generally not used in questionnaires owing to its lengthy nature. The short Ten Item Personality Inventory (TIPI) is preferred instead.

Researchers have studied the effect of these five traits on our responses to anchoring cues. One group found that people who scored high on openness to experience were more affected by the anchoring cue and did not report any role of the remaining traits. Another group found only the “Extraversion” trait to affect the responses to anchoring cues.

Our experiment sought to observe the effect of the 5 personality traits on our responses to anchoring cues.

## **Previous Work**

McElroy et al. showed that people who scored higher on “openness to experience” were more susceptible to the anchoring cues relative to those who scored low. In his experiment he divided the participants into two groups: Low anchor group and High Anchor group. Participants were first asked to estimate whether the length of the Mississippi river is more or less than 200 miles (Low Anchor) or 20,000 miles (High Anchor). Subsequently, they were asked to estimate the actual length of the Mississippi river. The 2<sup>nd</sup> part of the questionnaire consisted of the Ten Item Personality Inventory Test using which the personality traits were assessed. This was one of the two tasks done in the experiment.

## **Objective**

Our objective was to –

- Demonstrate the presence of the “Anchoring Effect”
- Determine the effect of the personality traits on our responses to anchoring cues

## Methodology

26 participants were presented with a questionnaire (Fig 1 and Fig 2). There were 2 sections in each questionnaire. We made 4 sets of questionnaires and each questionnaire would present a different anchor to the participant. The questionnaire was given randomly to a participant.

### Section A

They were first asked to estimate whether the height of the Eiffel Tower was greater than or less than \_\_\_\_\_ feet. The blank would contain one of the following values - 380, 840, 1280 or 1740. The 4 numbers serve as the 4 anchors. In the second question they were asked to estimate the height of Eiffel Tower.

{We did not simply ask the participants to estimate the length of the Ganga as it was felt that it would be difficult to visualize the length of a river and the participant would be forced to rely on the anchor. We sought some physical feature/ landform whose parameters would be easy to visualize. Eiffel Tower is a well-known monument and it is easy to visualize the entire Eiffel Tower.}

### Section B

This section consisted of the TIPI test which was used to assess the five personality traits. TIPI scale rates a person on a scale of 1-7. Most of the responses would lie between 3 and 6. Thus participants who scored less than 4.5 were placed in “Low” category for that particular trait and those scoring greater than 4.5 were placed in “High” category.

# QUESTIONNAIRE

*(Done as a part of the project for course - Cognitive Science {SE367})*

*By Sandarsh Pandey*

*Guide – Prof. Amitabha Mukherjee*

The questionnaire consists of Section A and Section B. We intend to study the role of personality traits on a certain variable.

## **Section A**

We do not seek the accurate answer in the questions below. We intend to study the responses which arise intuitively. So please fill the questionnaire below with the answer which comes to your mind intuitively.

Q 1) Is the height of the Eiffel Tower greater than or lesser than 380 feet?

Answer-

Please answer the question below **after attempting the above question.**

Q 2) Estimate the height (in feet) of the Eiffel Tower

Answer -

Fig 1: Section A of Questionnaire

### Section B

Section B assesses your personality traits. This questionnaire is anonymous and false reports would create errors in the study. So please provide the correct response.

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

I see myself as:

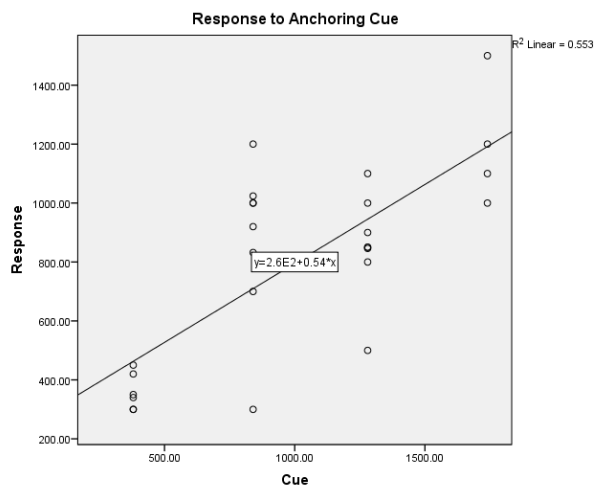
1. \_\_\_\_ Extraverted, enthusiastic.
  2. \_\_\_\_ Critical, quarrelsome.
  3. \_\_\_\_ Dependable, self-disciplined.
  4. \_\_\_\_ Anxious, easily upset.
  5. \_\_\_\_ Open to new experiences, complex.
  6. \_\_\_\_ Reserved, quiet.
  7. \_\_\_\_ Sympathetic, warm.
  8. \_\_\_\_ Disorganized, careless.
  9. \_\_\_\_ Calm, emotionally stable.
  10. \_\_\_\_ Conventional, uncreative.
- 

Source: TIPI

Fig 2: Section B of Questionnaire

# Results

## 1. Demonstration of anchoring



Correlations

		Cue	Response
Cue	Pearson Correlation	1	.744**
	Sig. (2-tailed)		.000
	N	26	26
Response	Pearson Correlation	.744**	1
	Sig. (2-tailed)	.000	
	N	26	26

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## 2. Effect of Personality Traits

**ResponseAd = Adjusted Response = |Anchor – Response|**

### a) Openness to Experience

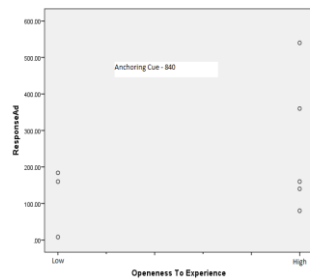


Fig 1: Cue - 840

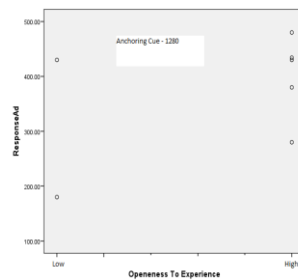


Fig 2: Cue - 1280

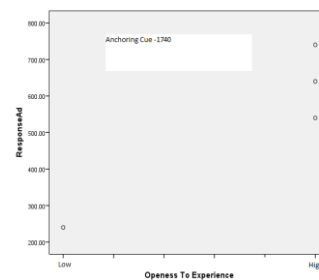


Fig 3: Cue - 1740

### b) Conscientiousness

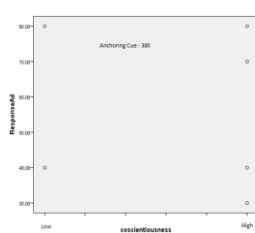


Fig 4: Cue - 340

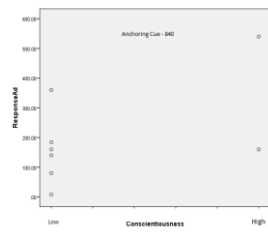


Fig 1: Cue - 840

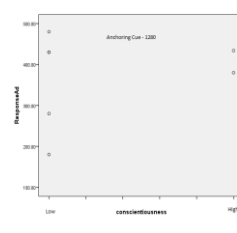


Fig 2: Cue - 1280

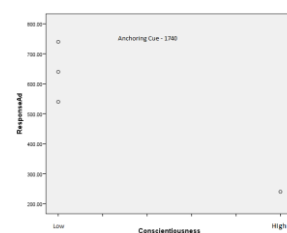


Fig 3: Cue - 1740

### c) Extraversion

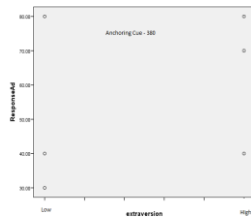


Fig 4: Cue - 340

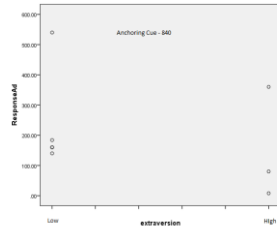


Fig 1: Cue - 840

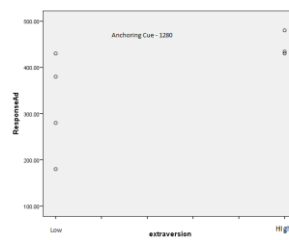


Fig 2: Cue - 1280

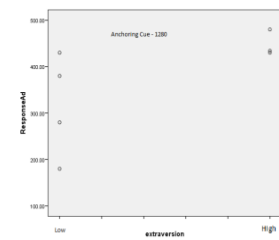


Fig 3: Cue - 1740

### d) Agreeableness

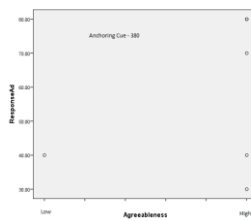


Fig 4: Cue - 340

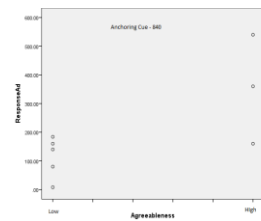


Fig 1: Cue - 840

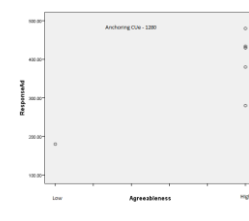


Fig 2: Cue - 1280

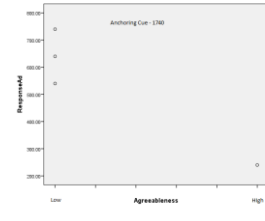


Fig 3: Cue - 1740

### e) Neuroticism

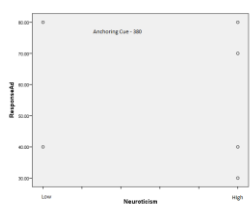


Fig 4: Cue - 340

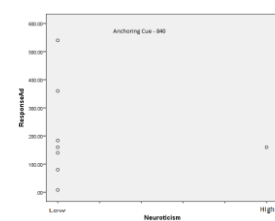


Fig 1: Cue - 840

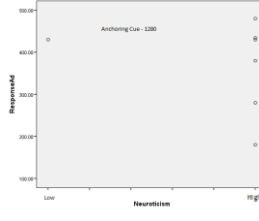


Fig 2: Cue - 1280

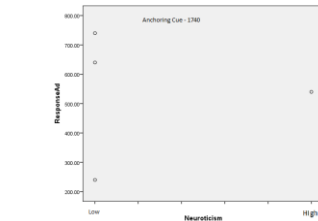


Fig 3: Cue - 1740

## Conclusions

The anchoring effect was successfully demonstrated. The Pearson Correlation Coefficient was 0.744 and statistically significant.

Of the five personality traits, only “Openness to Experience” and “Agreeableness” showed a pattern across all 4 anchoring groups. It was seen that people who scored high on these two traits were least influenced by the anchor. The only exception to this observation was seen in 1740 anchor group for the “Agreeableness” trait.

One explanation for this occurrence could be that since people who score high on “Openness to Experience” tend to be inquisitive, they would have visualized and wondered about the length of the Eiffel Tower despite being presented with an anchor.

The paper, however, reported that people who scored high on “Openness to Experience” were more susceptible to anchoring cues. Since each anchoring group consisted of only 5-6 members,

the data obtained is not statistically significant and in order to challenge the paper's conclusions, we would have to increase the data set.

## **Further Work**

We should increase the number of participants to at least 100 people so as to get statistically significant data. This study contained only one task. We could introduce more tasks once there are sufficient number of participants and check whether the same results are obtained in each task.

## **References**

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