

THE ROLE OF EMOTIONS IN COGNITIVE BIASES

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Personality
"Big Five" personality traits

- Openness to experience / intellect**
inventive/curious vs. consistent/cautious
- Conscientiousness**
efficient/organized vs. easy-going/careless
- Extroversion**
outgoing/energetic vs. solitary/reserved
- Agreeableness**
friendly/compassionate vs. cold/unkind
- Emotional stability / neuroticism**
sensitive/nervous vs. secure/confident

Introduction

Several studies suggest that, when people making important life decisions, often seek to maximize well-being and positive emotional experiences and minimize enduring disappointment, regret and other negative emotional states. Information processing by humans can be biased by their emotions – for example, anxious and depressed people tend to make negative judgments about events and to interpret ambiguous stimuli unfavorably (Harding, 2004). Our empirical work attempts to study the relations between cognitive biases and emotional personality traits.

A cognitive bias is any of a wide range of observer effects identified in cognitive science and social psychology including very basic statistical, social attribution, and memory errors that are common to all human beings. The notion of cognitive biases was introduced by Amos Tversky and Daniel Kahneman in 1972 and grew out of their experience of people's innumeracy or inability to reason intuitively with the greater orders of magnitude. Over the last decades, the theory about biases has developed significantly. The dual systems theory of human reasoning is one of the most important scientific input in psychology. Daniel Kahneman's recent book "Thinking, Fast and Slow" describes modern research on the two systems of the mind. "System 1" thinking processes operate automatically, process information fast, are heavily influenced by context, biology and past experience, aid humans in mapping and assimilating newly acquired stimuli into pre-existing knowledge structures, and are self-evidently valid (experience alone is enough for belief). In contrast, "System 2" thinking processes are deliberately controlled, effortful, intentional, and require justification via logic and evidence. Considering the dual system theory, all the biases are classified into two types: biases belonging to the "System 1" and biases belonging to the "System 2".

A wealth of research indicates that personality is intricately linked to emotional experience (Hoerger & Quirk, 2010). Indeed, some studies have proposed that the five factors of the Big Five test are largely due to biases (Biesanz & West, 2004; Paulhus & John, 1998). Personality has been conceptualized from a variety of theoretical perspectives, and various levels of abstraction or breadth (John, Hampson and Golberg, 1991, McAdams, 1995). Each of these levels has made unique contributions to our understanding of individual differences in behavior and experience.

The Big Five model of personality has gained extensive support during the past half century and characterizes personality along the dimensions of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (John & Srivastava, 1999). The Big Five taxonomy serves an integrative function because it represents diverse systems of personality description in a common framework.

Recent studies of biases and decision making have shown that people often rely upon their anticipated emotional reactions as a guide to choice. The purpose of the present study is to examine the extent to which cognitive biases might be in correlation with emotional personality traits.

Aim

The present study was conducted to investigate and to describe the relationships between personal traits and biases in order to understand the underlying effect of individual emotions on their decision making process.

The aim of the research is to analyse the link between biases (belonging to the "System 1") and individual differences expressed through different personal traits.

Participants and Procedure

90 Italian participants took part in the research. Participants come from the simulation Stock Market Learning.

Several rating instruments have been developed to measure the Big-Five dimensions. The most comprehensive instrument is Costa and McCrae's (1992) Neo Personality Inventory, which permits measurement of the Big-Five domains (FFM) and ten specific facets within each dimension.

20 tasks were selected starting from taxonomies of heuristics and biases (Carter, Kaufmann, & Michel, 2007; Stanovich, Toplak, & West, 2008) in order to have at least one problem for each bias. Our work was developed in an empirical way, by considering all biases without any previously formed opinion. This condition is fundamental in order to obtain a list of all the biases present in literature. The table with all the cognitive fallacies tested is on the right.

FALLACIES	DEFINITIONS
Affection effect	It is an effect due to the influence of negative or positive feeling state in decision making processes.
Aversion to ambiguity	Decision makers dislike ambiguity.
Availability heuristic	This disposition drives people to consider what is more available in their mind.
Belief bias	It is a cognitive bias that incurs in syllogistic reasoning or, more in general, in rational processes by inducing people to take a conclusion on the basis of their beliefs.
Confirmation bias	It is a tendency that induces people to prefer information that confirms their hypothesis and to avoid contrary possibilities.
Endowment effect	It is the tendency for people to evaluate something that they already own more higher than it really is.
Forer effect	People tend to accept vague and general personality descriptions as uniquely applicable to themselves without realizing that the same description could be applied to just about anyone
Framing	It is a phenomenon that influences people perception in decisions, on the basis of a positive or negative bordered context of decision.
Gambler's fallacy	It is an effect that induces people to consider small sequences of random processes influenced by previous changes.
Hindsight bias	It is a mental process that induces people to see an event already occurred as more predictable than it really is.
Information bias	This bias is due to an irrational management of information, in particular when a plus researched information does not provide to a better choice.
Illusion of superiority	People tend to rate themselves as better than average.
Imaginability bias	Imaginability of events affects its availability in process of choice.
Optimism bias	It is the tendency to consider a future outcome more probable if it is positive, and less probable if it is negative.
Planning fallacy	Planning fallacy is a sort of illusion that drives people to underestimate the time necessary to complete a task.
Regret aversion	Regret is an aversive emotion experienced upon the discovery that had a different choice been made a higher level of utility would have obtained than actually did.
Self-serving bias	A self-serving bias occurs when people attribute their successes to internal or personal factors and attribute their failures to situational factors beyond their control.
Representative bias	It is the disposition to violate the Bayesian calculation of probability in front of different and more representative options.
Wishful thinking	Tendency present in people that drives them to consider an event more probable because it is more desired.
Zero risk bias	It is a bias that induces people to avoid any form of risk and to strongly prefer options that could eliminate any type of threat.

Results and discussion

Results show the presence of a correlation between some fallacies and FFM dimensions. In particular, the Extraversion dimension showed a positive relation to the Self-serving bias, and a negative relation to the Congruence bias. This effect is probably due to the presence of Extraversion in judging situations and to seek confirmations. The Conscientiousness dimension showed negative relation with the ability to manage long-term plans and with searching information (Planning fallacy Information bias). The Openness dimension is positively correlated with two classic heuristics such as Representative and Availability heuristics. It is likely that these two heuristics are present in the processes of judgment and creation of stereotypes. The results of this research will find explanations in successive studies.

Main References

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		Extraversion	Conscientiousness	Openness
Self-serving bias	r.	.331	.188	.251
	p.	.019	.192	.079
Congruence bias	r.	-.410	-.621	-.158
	p.	.003	.670	.273
Information bias	r.	-0.252	-.342	-.292
	p.	0.08	.015	.251
Planning fallacy	r.	-.191	-.361	-.260
	p.	.464	.045	.752
Availability heuristic	r.	.156	.193	.312
	p.	.279	.180	.027
Representative heuristic	r.	.037	.122	.400
	p.	.797	.399	.004

Table 2: Correlations among heuristics and biases and factors of FFM.