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# Representativeness and Investment Decision Making

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***Abstract:*** *Representativeness is one of the most common cognitive errors surveyed by Behavioural Finance researchers. It demonstrates the investors' tendency to misinterpret the probability of an event or a series of events and associate this probability with random non-relevant situations when investment decisions have to be made. The present paper discusses the effect of representativeness both on everyday life and the stock market. In addition, it discusses the factors affecting the specific cognitive error, and also ways to address it in order to facilitate rational investment decisions and, thus, establish equilibrium in the stock market.*

***Keywords:*** *Behavioral Finance, Representativeness, Biases, Investment*

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## I. Introduction

Behavioral Finance (BF) has emerged to fill the gaps of the standard financial theory. Based on other disciplines, such as psychology, sociology and philosophy, BF examines and interprets the behavior of those involved in financial and stock markets to discover the cognitive and psychological errors which lead to wrong decisions and, thus, financial anomalies. Among the most common cognitive errors in the literature of Behavioural Finance is the representativeness heuristic, employed in decision making processes. Representativeness makes investors misinterpret the probability that an event or a series of events may occur, and associate this possibility with random completely different situations. The present paper attempts to examine the concept of representativeness, first, in a general context, and, subsequently, in the context of financial activity. In addition, it discusses the cognitive and emotional errors, which are directly related to representativeness and increase its occurrence rate. Finally, the research discusses ways to address the specific irrational mental effect and, thus, achieve rationality, proper investment choices and desired profitability.

## II. An Overview Of Representativeness

### 2.1 Representativeness

People's need for answers and decisions leads to the rule of representativeness (Kahneman and Tversky, 1973), which is described as the tendency to evaluate something, not on the basis of probabilities, but with reference to how closely it resembles something (Montier, 2002). It involves the classification of events, on the basis of one's experiences and knowledge. If something does not fit a familiar class of events, it tends to be associated with one which is most similar. When individuals, at times of uncertainty, are called to make decisions, they feel that the probabilities of familiar events will be as dynamic and relevant as recent and unfamiliar events, creating stereotypes on which they base evaluations and decisions. Consider an individual who is shy, antisocial and a meek and peaceful soul, but always with a passion for detail, order and structure. In terms of representativeness, it is most likely that, from a list of possible choices, this person is engaged in a particular profession (librarian, pilot, farmer, and physician). There are some stereotypes related to the characteristics of a profession which are used for categorizing people. People rank professions based on probability and similarity, but may be misled (Kahneman and Tversky, 1972).Individuals try to find common elements between real and previous events which they are able to recall from memory. They also mistakenly believe that very recent events cannot be soon repeated. For instance, they do not opt for lottery coupons with recent draws, as, according to the heuristic at issue, a recent draw will be more difficult to be repeated. However paradoxical this may be, all numbers are likely to win (Alexakis and Xanthakis 2008). Thus, rationality of probabilities is neglected and replaced by irrational behavior and fallacies.

### 2.2 Representativeness and investment processes

Representativeness is a cognitive error, which has a significant effect on stock market decisions. To associate representativeness with financial decisions, a discussion on the tendency of investors to operate on the

basis of their previous experience should be made. A recent pattern of high earnings growth makes investors believe that it is likely to repeat itself in the future. Future earnings growth predictability is inferred by past earnings using the heuristic of representativeness (Shleifer, 2000). The heuristic of representativeness encourages investors to invest in high earnings stocks (Barber, Odean, Zheng, 2000). Investors use the specific heuristic when they choose mutual funds. Recent improved performance of mutual funds implies gains both for the capital and also the fund owner, and it, hence, promises future capital growth. New investors are overconfident of the past improved performance and are convinced that high performance will last. Although the past history is representative of a future growth potential, it is not a key criterion. This is also true about investment decisions on individual stocks (mutual funds invest in a set of stocks). Observing past earnings growth, investors overreact or underreact to future earnings growth. Investors can extrapolate past history of high earnings too far into the future, thus, overpricing all glamour stocks (Shleifer, 2000). Investors opt for buying high earnings stocks, on the grounds that recent high earnings are representative of a future earnings growth (Dhar, Kumar, 2001). This stereotype will lead to a fallacy, as investing in 'glamour' stocks is usually insufficient (Lakonishok, Shleifer, and Vishny, 1994).The past history of low earnings growth of a company is affected by a number of reasons. Either the company has failed to claim a strong position in the capital market, and is, therefore, not as popular as others, or it may be steadily trying to "build" a brand, which implies that future prospects are not likely to be bright. On the other hand, past high earnings growth may have resulted from systematic and efficient work, which, however, is not a "letter of guarantee" for its future progress. Overall, representativeness tends to restrain investment decisions and create narrow-minded investors when decisions on equities must be made. It also creates stereotypes which contradict successful progress in investment processes. Representativeness is related to and affected by several biases, such as the conjunction fallacy, the law of small numbers, the gambler's fallacy and the hot-hand effect.

## III. Cognitive And Emotional Errors Associated With Representativeness

### 3.1 The Conjunction fallacy:

The conjunction fallacy is a fallacy of stereotypes and representativeness (Tversky and Kahneman, 1983), which has been tested in cognitive science and is involved in decisions based on intuition (Franco, 2009). It is observed when two events, which may occur together or separately, are most likely to occur together rather than separately, as people, when asked to compare, feel that conjunction is more likely (Tversky and Kahneman, 1983). To illustrate, when rolling a pair of dice to get a six and a four, it is more likely to get a six with two dice than only with one die (Cartwright, 2008).The conjunction error may be partly conducive to linguistic factors, such as ambiguous wording or different semantic inferences of "probability" (Fiedler, 1988). Camerer (1995) provides an alternative explanation about the high rate of violations of the conjunction principle in the framework of linguistic conventions. Accordingly, some biases may be generated because specific words carry more information than intended. Considering the conjunction fallacy from a realistic point of view, Hertwig and Gigerenzer (1999) make an interesting forecast: "If decisions are made based on probabilities, people will derive a non-mathematical concept of 'probability' ", and the percentage of violations of the conjunction fallacy will be high. Overall, people tend to violate the conjunction rule, with practical applications, even when they accept it in a general sense (Tversky and Kahneman, 1983).When the conjunction and probability fallacy is applied to stock market investments, it produces poor revenues and, over time, disastrous investments.

### 3.2 The law of small numbers

The law of small numbers involves decision making processes based on the characteristics of a population sample assessed through a small number of observations or limited data. The term is attributed to Kahneman & Tversky (1971) and is directly related to the gambler's fallacy and representativeness. When individuals make decisions in difficult times, they opt for generalized observations and surveys with small samples, overestimating the results of a small sample research. Most people, including many experts, do not appreciate research work based on small numbers or small populations and can frequently be led to exaggerated observations. Having a tendency to believe that a relatively small number of observations will faithfully reflect the general population (Cole, 2012), "people view a sample randomly drawn from a population as highly representative, that is, similar to the population in all essential characteristics" (Kahneman & Tversky, 1971). Based on a small number of data, they draw conclusions which are rather unrealistic, as poor data cannot help draw conclusions and make decisions. In terms of the stock market, a positive general index does not imply high returns on all stocks. Stock and investment performance, can be differentiated in a generally favorable stock market environment. On the other hand, successful short-term stock and investment performance does not necessarily imply a good investment choice, since word-of-mouth or favorable stock market conditions may have attributed to its popularity rather than any improvement of fundamentals or solutions to potential problems.

**3.3 The Gambler's fallacy:**

It is the mistaken belief that a certain random event is less likely or more likely, given a previous event or a series of events, that random previous events can affect the probability of random future events. To illustrate, if a "fair" coin toss has come up three heads in a row, it is anticipated that the next coin toss will be tails. The gambler's fallacy is a phenomenon which involves people's inappropriately anticipating inversion (Shefrin, 2000). To illustrate, in his survey, Terrell (1994) argues that it is a common belief that, if a number wins a lottery, it is less likely to win again and, therefore, people do not bet on it. The specific statement is also corroborated by Clotfelter & Cook (1993).According to Tversky & Kahneman (1971), the gambler's fallacy is related to the bias of representativeness. "Subjects act as if every segment of the random sequence must reflect the true proportion: if the sequence has strayed from the population proportion, a corrective bias in the other direction is expected". Their intuition about random events is rather bad and they expect reversals more often than usual. Investors and people involved in the capital market act similarly. They are confident that a continuous negative return will recover (contrary to any real evidence). In addition, a long-term low earnings stock growth will improve, despite any financial problems or poor company management, which are most likely to be the actual reasons for negative returns.

**3.4 The hot-hand fallacy:**

The "hot hand" effect describes a fallacy which is the exact opposite of the gambler's fallacy. The specific fallacy is linked to basketball and the players' hitting shots, and highlights that after two or three successful shots a player's hand will remain hot and will continue to score. Gilovich, Vallone and Tversky (1985) have demonstrated that those who believe in the hot hand fallacy feel that in a basketball game, a player has more chances to hit a shot following a hit than following a miss. Thus, people tend to believe that successive positive results can be repeated, or that "success brings more success."The hot hand fallacy is caused by the illusion of control (Langer, 1975), according to which individuals believe they can exercise control over events which are actually determined by chance. The specific fallacy may also affect investment activity in the stock market. To manage their portfolios, prospective investors may consult professionals who are completely unknown, simply because they were successful in previous investment cases. This also applies to the case of decision making on stocks and mutual funds with a past positive return (Havlíček, 2012). In terms of statistics, this does not apply and there can be no reasonable explanation. The stock market is volatile and unpredictable, thus, investors cannot make any forecasts only on the basis of previous actions. Psychological fallacies lead to wrong choices and decisions, negative returns and, consequently, financial dead ends.

## IV. Preventing Representativeness

**4.1 Awareness of the new investment model of behavioral finance:**

Based on the new theory of Behavioural Finance, investors are able to learn about and understand emotional and cognitive errors, and realize that rationality is not always the single criterion when making a decision. Awareness of weaknesses, stereotypes, biases and psychological errors enables the perception of irrational behavior and, thus, methods to address and prevent it. The study of the new investment model which combines disciplines, such as statistics, mathematics, sociology, psychology and anthropology, enables realizing the significance of the impact of human psychology and, generally, human behavior on shaping investment attitudes. Investors must, therefore, be confronted with irrational judgements: that two events are more likely to occur together (the conjunction fallacy), that sometimes decisions can be made by relying on a small sample of data (the law of small numbers), and also that previous random events may change the probability of future random events (the gambler's fallacy and hot-hand effect).Awareness and investigation of the underlying psychological factors allow investors to perceive the utopian aspect of rationality, and, thus, differentiate their investment attitudes.

**4.2 Cognitive Reflection Test**

Strangely but commonly enough, a large percentage of investors are victims of investment fallacies and deviate from rationality and rational thinking. This results from individuals and investors' inability to suppress intuitive and spontaneous rather than thoughtful, deliberate and correct responses. The Cognitive Reflection Test (C.R.T.) was designed to evaluate a specific cognitive ability and prevent individuals from spontaneous and impulsive reactions. People often act on impulse rather than reason. Solutions, reactions and decisions are easy to understand. However, in order to get to a correct answer it is necessary to suppress the wrong one, which spontaneously springs from the mind. Problems seem to get worse in the case of investment decision making. As the brain operates in an emotional rather than rational manner, potential low earnings growth ensues a financial disaster. When emotions and impulse are harnessed, rationality and critical thinking are dominant, and investment decisions are aimed at profit making.

**4.3 Awareness of the human nature**

The awareness of the diversity of mental and decision making processes and also of people's inability to always make rational decisions and choices can lead to successful investments. People, including investors, build their personalities depending on their own experiences, environment, culture as well as mentality and biases. Diversity awareness enables distinguishing particular behaviors and, more specifically, particular investment behaviors. The image of non-vulnerable, unfailing, rational investors, emphasized in the traditional finance theory, is a false image, which leads to wrong conclusions and decisions. The stock market is described as volatile, continuously changing and unpredictable. The market does not remain efficient in all aspects and for a long time. Problems in investment processes make investors display an unusually strange behavior. Fear, dislike and uncertainty drive people's minds into unexpected, non-rational paths. Awareness and recognition of weaknesses and irrational actions establish rationality and efficiency. Being aware of ourselves, we become aware of our actions as well.

## V. Conclusion

People's need for answers leads to the rule of representativeness (Kahneman & Tversky, 1973). Decision making often requires trying to find common elements in different problems. People feel that resembling or similar events share common points, even when random events are not completely random, that is, by ignoring the probability law. When the cognitive error of representativeness affects investment behavior and stock market decisions, the impact may be detrimental to the progress of the stock and derivatives market. The study of the biases and cognitive errors, which affect and enhance representativeness, enables a better understanding and perception of one of the fundamental reasons of irrationality. When investors feel that two events, which may occur together or separately, are most likely to occur together (Conjunction fallacy), or when they make decisions on the basis of a small number of data (The law of small numbers), or when they mistakenly believe that random previous events may change the probability of random future events (the gambler's fallacy, the Hot-hand fallacy), investment decisions deviate from rationality. To address the cognitive error of representativeness, it is essential that people understand the new financial theory of behavior, and also the biases, psychological factors and heuristics which hamper rationality and lead to irrational investment decisions. In addition, the Cognitive Reflection Test enables realizing that irrationality generates as a result of people and investors' tendency to suppress a correct rather than an impulsive response. In addition, it facilitates the understanding of human weaknesses and distinct personality traits, which distinguish people from rational invulnerable investment robots. The discussion of the cognitive error of representativeness and its substantial impact on investment behavior enables understanding the significance of the theory of Behavioural Finance in investment decisions. It also highlights the need to replace the traditional theory with Behavioral Finance, and establish it as the dominant financial paradigm.

## References


[1]. Alexakis, Ch. and Xanthakis, M., 2008. Behavioral Finance, Stamoulis Publications, Greece.
[2]. Banerjee A., 1992. A simple model of herd behavior. *Quarterly Journal of Economics*, Vol.107, No.3, pp. 797-817.
[3]. de Bondt, W. and Thaler, R., 1995. Financial decision-making in markets and firms: A behavioral perspective. *Handbooks in Operations Research and Management Science*, Vol. 9, pp. 385-410.
[4]. Barber, B., Odean, T., and Zheng, L., 2000, The Behavior of Mutual Fund Investors, *Faculty and Research*, pp.1-49.
[5]. Barberis, N., and Thaler, R., 2003. A survey of behavioral finance. *National Bureau of Economic Research*. Vol. 1, No 2.
[6]. Belsky, G. and Gilovich, T., 1999. Why Smart People Make Big Money Mistakes - And How to Correct Them Lessons From the New Science of Behavioral Economics, Simon and Schuster. N.Y.
[7]. Biais, B., Mazurier, K., and Pouget, S. 2002. Psychological Traits and Trading Strategies. *C.E.P.R. Discussion Papers*, No 3195, pp. 1-31.
[8]. Brunnermeier, K. and Parker J., 2005. Optimal expectations. *American Economic Review*, Vol. 95, No.4, pp. 1092-1118.
[9]. Camerer, C., 1995. Individual decision-making, *Princeton University Press*, pp. 587–703.
[10]. Camerer, C., 1987. Do Biases in Probability Judgment Matter in Markets -Experimental-Evidence, *American Economic Review*, Vol.77, No.5, pp. 981-997.
[11]. Cartwright, J. 2008. Evolution and Human Behaviour, 2nd ed. Basingstoke: Palgrave Macmillan, U.K.
[12]. Chen, G., Kim, K., Nofsinger, J., Rui, O., 2007. Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias and Experience of Emerging Market, *Investors Social Science Research Network*, pp. 1-55.
[13]. Cole N., 2012. How Myths Are Formed! The Law Of Small Numbers & Market Research, http://www.greenbookblog.org/2012/05/11/how-myths-are-formed-the-law-of-small-numbers-market-research/(accessed, 5/9/2017)
[14]. Clotfelter, C., and Cook. P., 1993. The 'Gambler's Fallacy' in Lottery Play, *Management Science*, Vol. 39, pp. 1521–1525.
[15]. Daniel, K., Hirshleifer, D., and Subrahmanyam, A., 1998. Investor psychology and security market under- and over-reactions, *Journal of Finance*, Vol.53, pp.1839-1886.
[16]. De Bondt, W., Thaler, R., 1985. Does the Stock Market Overreact? *Journal of Finance*, Vol. 40, No 3, pp. 793-805.
[17]. De Michele, E., Gansneder, B., and Solomon, B., 1998. Success and failure attributions of wrestlers: Further evidence of the self-serving bias. *Journal of Sport Behavior*, Vol. 21, pp 242–255.
[18]. Dhar, R., and Kumar, A. 2001. A non-random walk down the main street: Impact of price trends on trading decisions of individual investors, *International Center for Finance, Yale School of Management, New Haven*, Vol. 4.

[19]. Fiedler, K., 1988. The dependence of the conjunction fallacy on subtle linguistic factors, *Psychological Research*, Vol. 50, No. 123-129.
[20]. Fischhoff, B., 1975. Hindsight Foresight: The effect of outcome knowledge on judgment under uncertainty, *Journal of Experimental Psychology: Human Perception and Performance*, Vol. 1, pp. 288-299.
[21]. Fischhoff, B., 1997. What do psychologists want? Contingent valuation as a special case of asking questions. *Kluwer Academic Publishers*, Vol.10, pp 189-217.
[22]. Franco, R., 2009. The conjunction fallacy and interference effects, *Journal of Mathematical Psychology*, Vol.53, No. 5, pp. 415-422.
[23]. Frey B., and Eichenberger R., 2001. How goes it with Swiss Economics? *Swiss Society of Economics and Statistics*, Vol. 137, pp. 525-533.
[24]. Gilovich, T, Tversky, A.; Vallone, R. 1985. The Hot Hand in Basketball: On the Misperception of Random Sequences, *Cognitive Psychology*, Vol. 3, No 17, pp. 295–314.
[25]. Graham, B., Dodd, D., 1965. The Intelligent Investor. Harper & Row, New York.
[26]. Griffin, D., and Ross M., 1994. Exploring the "planning fallacy": Why people underestimate their task completion times. *Journal of Personality and Social Psychology*, Vol. 67, No. 3, pp. 366–381.
[27]. Goldberg, J., and, Nitzsch, R., 2001. Behavioral Finance, John Wiley & Sons, New York.
[28]. Goldberg, J., and, Rüdiger Von N., 2001. Behavioral Finance, John Wiley & Sons, N.Y.
[29]. Havlíček, D. 2012. Behavioral Biases Gambler's Fallacy and Hot Hand on the Example of Czech Open-end Mutual Funds, *Management and Behavioral Sciences*, pp. 492-498.
[30]. Helweg-Larsen M., Shepperd, J., 2001. Do Moderators of the Optimistic Bias Affect Personal or Target Risk, *Personality and Social Psychology Review*, Vol. 5, No. 1, pp. 74–95.
[31]. Hertwig, R., and Gigerenzer, G., 1999. The Conjunction Fallacy' Revisited: How Intelligent Inferences Look Like Reasoning Errors, *Journal of Behavioural Decision Making*, Vol. 12, pp. 275-305.
[32]. and Hong T., 2005, Limited investor attention and stock market misreactions to accounting information, *Working paper, University of California, Irvine*.
[33]. Kahneman, D., and Frederick, S., 2002. Representativeness revisited: Attribute substitution in intuitive judgment, *Cambridge University Press*, pp. 49-81.
[34]. Kahneman, D., Tversky, A., 1972. Subjective Probability: A Judgment of Representativeness, *Cognitive Psychology*, Vol. 3, pp. 430–454.
[35]. Kirchler, E., and Maciejovsky, B. 2002. Simultaneous Over- and Underconfidence: Evidence from Experimental Asset Markets. *Journal of Risk and Uncertainty*, Vol. 25, No. 1, pp.65–85.
[36]. Lakonishok, J., Shleifer, A., and Vishny, R., 1994. Contrarian investment, extrapolation and risk., *Journal of Finance*, Vol.49, pp. 1541–1578.
[37]. Langer, E., 1975. The illusion of control, *Journal of Personality and Social Psychology*, Vol. 32, No.2, pp. 311-328.
[38]. Manove, M., 1995. Enterpreneurs, optimism and the competitive edge. Bellaterra, Barcelona.
[39]. Manove, M., and Padilla, J., 1999. Banking (conservatively) with optimists. *Journal of Economics*, Vol. 30, No. 2 pp. 324–350.
[40]. Montier, James, 2002. Behavioural Finance: Insights into Rational Minds and Markets. John Wiley & Sons, New York Pompian, M., 2006. Behavioral Finance and Wealth Management. John Wiley & Sons Inc. New Jersey.
[41]. Nofsinger, J., 2001.Behavioral Finance, John Wiley &Sons. U.S.A.
[42]. Nofsinger, J., and Kim, K., 2003. Infectious Greed: Restoring Confidence in America's Companies, *Financial Times- Prentice Hall, New Jersey.*
[43]. O'Creevy, M., Nicholson N., Soane E., and Willman P., 2003. Trading on illusions: Unrealistic perceptions of control and trading performance, *Journal of Occupational and Organizational Psychology (British Psychological Society)*, Vol. 76, pp. 53–68.
[44]. Odean, T. (1998). Volume, Volatility, Price and Profits When All Traders Are Above Average. *Journal of Finance*, Vol. 53, No.6, pp. 1887-1934.
[45]. Plous, S. (1993). The psychology of judgment and decision making. New York: McGraw-Hill.
[46]. Seppälä A., 2009. Behavioral Biases of investment advisors The Effect of Overconfidence and Hindsight Bias, Master's Thesis, *Helsinki School of Economics.*
[47]. Shefrin H., and Statman, M., 2011. Behavioral Finance in the Financial Crisis: Market Efficiency, *Minsky, and Keynes, Santa Clara University*, pp. 1-62.
[48]. Shefrin, H., 2001. Behavioral Corporate Finance, *National Bureau of Economic Research*, Vol.14, No 3, pp. 21-33.
[49]. Shefrin, H., 2000. Beyond greed and fear. Understanding behavioral finance and the psychology of investing, Harvard Business School Press, U.S.A.
[50]. Shepperd, J., 2008. Exploring Causes of the Self-serving Bias, *Social and Personality Psychology Compass*. Vol.2, No 2, pp 895-908.
[51]. Shiller, R., 1987. Investor Behavior in the October 1987 Stock Market Crash: Survey Evidence. *National Bureau of Economic Research, Working Paper* No. 2446.
[52]. Shiller, R. 2000. Irrational Exuberance. Princeton University Press, Princeton, New Jersey.
[53]. Shleifer, A., 2000, Inefficient Markets: An Introduction to Behavioral Finance, Clarendon Lectures in Economics, U.K.
[54]. Simon H., 1955. A Behavioral Model of Rational Choice, Quarterly Journal of Economics, Vol. 69, pp. 99–188.
[55]. Simon, H., 1987. Behavioural economics, *The New Palgrave Dictionary of Economics*, Vol. 1, pp. 221-225.
[56]. Stewart, E., 2005. Attributions of responsibility for motor vehicle crashes, Accident Analysis and Prevention, Vol.37, pp 681–688.
[57]. Taffler, R., 2009. The Role of Behavioural Bias and Conflicts of Interest in Analyst Stock Recommendations, *Journal of Business Finance and Accounting*.Vol. 36, pp. 384-418.
[58]. Taylor S. and Brown D. 1988. Illusion and Well-Being: A Social Psychological Perspective on Mental Health, *Psychological Bulletin*, Vol. 103, No. 2, pp. 193–210.
[59]. Tentori, K., Bonini, N., Osherson, D., 2004. The conjunction fallacy: a misunderstanding about conjunction?, *Cognitive Science*, Vol. 28, pp 67–477.
[60]. Terrell, D., 1994. A Test of the Gambler's Fallacy: Evidence from Pari-Mutuel Games, *Journal of Risk and Uncertainty*, Vol.8, pp. 309–317.
[61]. Thaler, R., 1999. The End of Behavioral Finance, *Financial Analysts Journal*, Vol. 56, No. 6, pp.12-17.
[62]. Thaler, R., and Shefrin H., 1981. An economic theory of self-control, *Journal of Political Economy*, Vol. 89, pp. 392-406.
[63]. Thaler, R., Johnson, E., 1990. Gambling with the House Money and Trying to Break Even, *Management Science*, Vol. 36, No. 6, pp. 643-652.

[64]. Thaler, R., Tversky, A., Kahneman, D., Schwartz, A., 1997, The effect of Myopia and Loss Aversion on Risk Taking: An Experimental Test, *Quarterly Journal of Economics*, Vol. 112, No. 2, pp. 647-661.
[65]. Toplak, M., West, R., and Stanovich, K., 2011. The Cognitive Reflection Test as a predictor of performance on heuristics-and-biases tasks, *Psychonomic Society*, Vol.39, pp.1275–1289.
[66]. Tversky, A. and Kahneman, D.,1971.Belief in the law of small numbers, *Psychological Bulletin*, Vol. 76 ,No 2. 76, 105-110, pp. 105-110.
[67]. Tversky, A. and Kahneman, D., 1973. Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, Vol. 5, No 2, pp. 207-232.
[68]. Tversky, A. and Kahneman, D., 1974. Judgement under uncertainty: Heuristics and biases. *Science, New series*, Vol. 185, No 4157, pp.1124-1131.
[69]. Tversky, A., and Kahneman, D., 1981. The framing of decisions and the psychology of choice, *Science*, Vol. 211, pp.453–458.
[70]. Tversky, A., and Kahneman, D., 1983. Extensional versus intuitive reasoning: The conjunction fallacy in probability judgments, *Psychological Review*, Vol. 90, pp. 293-315.
[71]. Weinstein, D., 1980. Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, Vol. 39, No 5, pp. 806-820.
[72]. Zuckerman, M., 1998.A nondefensive personality: Autonomy and control as moderators of defensive coping and self-handicapping. *Journal of Research in Personality*, Vol. 32, pp.115-130.

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