Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231– 6345 (Online)
An Open Access, Online International Journal Available at www.cibtech.org/sp.ed/jls/2015/01/jls.htm
2015 Vol.5 (S1), pp. 5515-5521/Ardakani et al.
Research Article

RELATIONSHIP BETWEEN PERSONALITY DIMENSIONS AND COUNTERFACTUAL THINKING IN RUNNERS IN IRAN'S SUPER LEAGUE IN 2013-2014

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ABSTRACT
After experiencing defeat, humans think how they could produce more satisfactory outcomes and attempt to improve their future performance. This thinking is called counterfactual thinking which includes three negative dimensions (upward self-referent, no-referent and other-referent counterfactual thinking) and one positive dimension (downward counterfactual thinking). Personality is defined as distinct and stable emotions, thoughts, and behavior patterns which are indications of compatibility with surrounding environment. According to Neo theory, there are five personality dimensions: neurosis, extroversion, openness, agreeableness, and conscientiousness. These dimensions are correlated with counterfactual thoughts in cases of tragic events. The present study attempts to determine correlation between personality dimensions and counterfactual thinking in runners of Iran's super league in 2013-2014, in accordance with Neo five-factor personality theory. The population consisted of 118 runners, of which we selected 92 athletes by using Morgan Table. For data collection, three questionnaires were distributed: Demographic Inventory, Inventory of Counterfactual Thinking for Negative Events Scale (CTNES) &Neo Five-factor Inventory (NEO-FFI). For data analysis, we performed Kolmogorov-Smirnov test, Pearson's correlation coefficient test, and regression analysis and used descriptive statistics. Our findings revealed significant correlation between personality dimensions and counterfactual thinking. Specifically, upward counterfactual thinking was significantly and positively correlated with openness. Accordingly, they can achieve success in future events. Also highly agreeable persons did downward counterfactual thinking. But, neurotic persons apply upward counterfactual thinking and feel frustrated about future competitive events.

Keywords: *Counterfactual Thinking, Personality, Norm Theory, Functional Model*

INTRODUCTION
Counterfactual thoughts including simulation of alternative counterfactual options are interrelated with a broad scope of mental consequences and can affect causal judgments (Meier *et al.*, 2001). Also, they inspire distinct feelings of happiness, regret, etc. (Boninger *et al.*, 1994).
Counterfactual thoughts are psychologically defined as humans' tendency for possible alterations to past negative events and are contrary to past events i.e. they coping behaviors for past events (Roese, 1997). These thoughts are expressed by sentences such as ((what if …?)) and ((If I …). They come to mind when humans believe that events could occur differently. These counterfactual alterations cannot really occur because they are related with past events (Roese, 1997).
In case of counterfactual thoughts, humans mentally make alterations in past events prior to the concerned unfolded event and then measure their outcomes. Suppose an accident. Two counterfactual thoughts may pass through our mind: (1) If I drove more slowly, I did not meet with any accident; or (2) If didn't fasten my safety belt, I could die (Roese and Olson, 1995). Counterfactual thoughts have three dimensions: direction, structure, and reference (ibid). As far as direction is concerned, counterfactual thoughts are either upward- or down-ward directed. Upward counterfactual thoughts such as the above-mentioned case (1) are imagination of more satisfactory outcomes as compared with past unfolded events. Conversely, downward counterfactual thoughts such as the above-mentioned case (2) are imagination of more unfortunate outcomes in comparison with past occurred events (Roese and Olson, 1995).

On the other hand, counterfactual thoughts are divided into additive and subtractive structures. The former involves additions to the concerned situation and it's restructuring. For example, if I applied brake, I did not have accident with that car. Contrarily, the latter is omission of some components from the concerned event. For instance, if I did not answer phone, I didn't cause accident (Roese, 1997).

Additionally, counterfactual thoughts are self-referent, other-referent or no referent. The former is described as referencing the concerned past event to our own performance. For example, the driver may suggest: If my attention was not distracted, I did not cause accident. Conversely, other-referent counterfactual thoughts are described as referring the concerned past event to others' performance. For instance, the other drivers should have driven more carefully. In no-referent case, humans do not refer the concerned event to their own performance or other's performance. For instance, the consequence could lead to more harmful consequences although the present consequence is damaging by itself (Epstude and Roese, 2008; Rye *et al.*, 2008).

According to norm theory (Kahneman and Miller, 1986) and functionalmodel of counterfactual thinking (Roese, 1997), emotional responses are negatively correlated with counterfactual thinking direction. To put it differently, upward counterfactual thinking calls forth negative emotional response while downward counterfactual thinking provokes positive (or slightly negative) emotional response (Markman *et al.*, 1993; Medvec *et al.*, 1995).

The term *personality* is derived from the Latin word *persona* which means theatrical mask worn by ancient Greek and Rome actors. Accordingly, individuals' personality is implied as the mask worn in a way that they can be distinguished from others. In other words, personality is an indication of observable features of humans (Schultz, 2013). Moreover, as Hilgard (2002) points out, personality is viewed as patterns of behavior and thinking which determine compatibility with surrounding environment. Some others attribute personality to permanent traits of humans, defining it as consistent and permanent traits and predictors of behavior (Santrock, 2003). Scholars describe personality in terms of 5 dimensions (John *et al.*, 2005) which are as follows: neurosis (behavior patterns such as unrest, anxiety, depression, and anger vs. emotional stability), extraversion (behavior patterns like enthusiasm, sociability, courage, and activeness vs. introversion), openness (including innovation, independence, creativity, diversification, and curiosity), agreeableness (behavior patterns such as amiability, altruism, humility, and politeness), and conscientiousness (behavior patterns like continence, attempt to succeed, self-discipline, hardworking, trustworthiness, and discipline) (Weinberg and Gould, 2013; McRae and Costa, 2008). These five dimensions are general personality traits i.e. specific traits are their components (McRae and John, 1992).

Behavior patterns which emerge due to mental simulation are indications of different uses of counterfactual thoughts. Indeed, counterfactual thoughts are significantly related with emotions and aims of persons (Epstude and Roese, 2008). Parameters making relations between these functions play significant role in counterfactual thinking. Findings reveal significant impact of personality traits upon mental simulation. Sanna (2000) indicates that along with limited traits such as optimism and self-confidence, positive and negative emotions impact upon counterfactual thoughts. Since all five above-said dimensions are effective parameters for thinking, they all especially extroversion and neurosis are expected to exert impact upon counter thinking types (Steel *et al.*, 2008). Also, Sanna *et al.*, (2006) find relationship between personality dimensions and satisfactory and unsatisfactory emotions and highlight their impact upon these emotions.

Kahneman and Miller (1986) introduce norm theory as one of fundamental theories about counterfactual thinking, on the basis of which norms involve comparison between cognitive standard and experienced reality.The identified dimensions can provoke emotional response i.e. this response is affected by intensity and direction of personality. For instance, in the case that a servant gets a raise for overtime working, he is filled with positive emotions. As this theory suggests, upward and downward counterfactual thinking provokes negative and positive emotions respectively (Kahneman and Miller, 1986; Markman *et al.*, 1993).

Functionalmodel is the other theory which takes counterfactual thinking and its process into consideration. According to this model, counterfactual thinking performs a supportive function and helps

persons not repeat past events. This thinking has an emotional function and makes contribution to positive feelings because persons make a comparison between their current situation and the possible tragic event. For instance, the runner who did not gain win is satisfied with the fact that he is not the last runner (Markman and Miller, 206).

As norm theory norm theory (Kahneman and Miller, 1986) and functionalmodel of counterfactual thinking (Roese, 1997) suggest, emotional responses are negatively correlated with counterfactual thinking direction i.e. upward counterfactual thinking calls forth negative emotional response while downward counterfactual thinking provokes positive (or slightly negative) emotional response (Markman *et al.*, 1993; Medvec *et al.*, 1995).

Findings of Allen *et al.*, (2013) examining personality traits and counterfactual thinking in athletes are consistent with this claim. They reveal a correlation between personality traits (neurosis, extroversion, and openness) and counterfactual thinking direction.

Openness and neurosis are negatively and positively interrelated with upward (self-referent, other-referent or no referent) counterfactual thinking respectively.

Negative events occur inevitably and subsequently counterfactual thoughts come to mind. Specifically, as defeat is one of certain outcomes in sports competitions and as runners cannot receive medals in a fraction of milliseconds and may feel negative emotions, the present study attempts to determine whether there is correlation between personality dimensions, emotions and counterfactual thinking after defeat among runners in Iran's super league and whether runners with different personalities can avoid negative counterfactual thinking after experiencing defeat.

MATERIALS AND METHODS

Methodology

The present study intends to examine relationship between personality dimensions and counterfactual thinking among male runners of Iran's super league in 2013-2014, on the basis of Neo five-factor theory. It is a correlational, descriptive research. The population consisted of 118 runners, of which we selected 92 athletes by using Morgan Table.

For data collection, three questionnaires were distributed: Demographic Inventory, Inventory of Counterfactual Thinking for Negative Events Scale (CTNES) &Neo Five-factor Inventory (NEO-FFI). Their validity and reliability were assessed and confirmed in Iran. Athletes' personality traits were determined by 60-item Neo Personality Trait Inventory which was designed by McRae and Costa and examines five main personality traits including neurosis, openness, extraversion, agreeableness, and conscientiousness (Schultz, 2013).

Its Persian version was designed by Kiyanmehr (2002). Reliability of different sections of this questionnaire was calculated between %64 and %83 as Cronbach's alpha shows.

CTNES inventory involves 16 factors for examining counterfactual thinking (Rye *et al.*, 2008). Respondents are asked to remember a recent tragic event, think subsequent thoughts, and then choose the answer which is most similar to their counterfactual thoughts: (1) never, (2) rarely, (3) sometimes, (4) often, and (5) always. Additionally, this inventory consists of 4 subscales including 4 question items, which are as follows: (1) self-referent and upward, (2) no-referent and downward, (3) other-referent and upward, and (4) no-referent and upward. Data were analyzed by Pearson's' correlation coefficient and simple regression.

RESULTS AND DISCUSSION

Results

Descriptive findings about personal traits of the concerned runners show 24.26 and 5.56 respectively for age mean and standard deviation. Also, over %50, %25, and %20 respectively took part in club competitions, national competitions, and provincial competitions.

Tables 1 and 2 show descriptive details of personality dimensions and counterfactual thinking in the concerned runners.

Table 1: Descriptive Details of Personality Dimensions in Studied Athletes

		Variation	Minimum	Maximum	Mean	Standard Deviation
Personality Dimensions	**Neurosis**	9.33	1.33	10.67	7.18	1.89
	Extraversion	9.33	4.33	13.67	9.75	1.57
	Openness	4.33	7	11.33	9.19	1.17
	Agreeableness	6	6.33	12.33	9.23	1.3
	Conscientiousness	5	7.33	12.33	9.88	1.19

Table 2: Descriptive Details of counterfactual Thinking in Studied Athletes

		Variation	Minimum	Maximum	Mean	Standard Deviation
Counterfactual Thinking	**Upward & Self-referent**	15	0	15	8.33	3.23
	Downward & No-referent	15	1	16	8.88	3.39
	Upward & Other-referent	13	0	13	9.21	2.95
	Upward & No-referent	16	0	16	8.85	2.98

As Pearson's correlation test results revealed, openness (r=.395, p<.01) and agreeableness (r= .535, p<.01) were significantly and positively correlated with downward counterfactual thinking.

Table 3: Statistical Details of Simple Regression Analysis for Personality Dimensions' Prediction of Counterfactual Thinking. **0.05; * 0.01

	Predictive Variable	R SQUARE	B	β	Standard Error	T
Downward & No-referent Counterfactual Thinking	Constant	0.156	-1.59	-----	-0.41	2.89
	Openness		1.14	*0.395	2.71	0.419
Downward & No-referent Counterfactual Thinking	Constant	0.286	21.7	-----	3.25	6.69
	Agreeableness		1.39	**0.535	0.34	4.01
Upward & Self-referent Counterfactual Thinking	Constant	0.109	4.2	-----	1.88	2.27
	Neurosis		0.56	*0.33	0.254	2.21
Upward & Other-referent Counterfactual Thinking	Constant	0.162	4.12	-----	1.66	2.83
	Neurosis		0.62	**0.402	0.22	2.77
Upward & No-referent Counterfactual Thinking	Constant	0.125	4.85	-----	1.72	2.81
	Neurosis		0.55	*0.354	0.233	2.39

Similarly, there was significantly direct relationship between neurosis and upward self-referent counterfactual thinking (r=.33, p<.05), upward other-referent counterfactual thinking (r=.402, p<.01) and upward no-referent counterfactual thinking (r=.354, p<.05). Conversely, no other significant correlation was observed (P>.05).

We performed simple regression analysis in order to predict counterfactual thinking styles by personality dimensions (Table 3). Remember that regression test was only performed for variables with significantly correlation coefficient. As Table 3 shows, downward no-referent counterfactual thinking could be predicted by openness and agreeableness. Additionally, neurosis was considered as predictor of all three factual thinking styles.

Discussion & Conclusion

This study examined correlation between personality dimensions and counterfactual thinking in runners of Iran's super league.Data analysis demonstrated relationship between some personality dimensions and counterfactual thinking. Correlations of openness and agreeableness with downward no-referent counterfactual thinking are two instances. Accordingly, these two personality dimensions were viewed as predictors of downward no-referent counterfactual thinking.

Five-factor personality model (McRae and Costa, 1985 & 1987) takes neurosis, extroversion, openness, agreeableness, and conscientiousness into consideration. Persons with openness encourage innovation and creativity, display independence, and demonstrate bravery. And, agreeableness involves behavior patterns such as amiability, altruism, humility, and politeness. Consequently, both openness and agreeableness provoke positive emotions. As regards openness, our findings were consistent with studies of Murphy (2005) and Allen *et al.,* (2013). Murphy (2005) evaluated impact of personality dimensions and health upon counterfactual thinking and indicated that Persons with openness often did downward counterfactual thinking. Allen *et al.,* (2013) revealed a significantly negative correlation between openness and upward counterfactual thinking. Since all three upward counterfactual thinking styles provoke negative emotions and are contrary to downward counterfactual thinking, our findings confirmed study of Allen *et al.,* (2013).

As McRae and Costa (1985) points out, in persons with openness, there is flexibility and their activities are activities compatible with situations. As a result, they experience less negative feeling. Sanna (2006) suggested a negative correlation between openness and upward counterfactual thinking.

On the basis of norm theory (Kahneman and Miller, 1986) and functional model of counterfactual thinking (Roese, 1997), emotional responses are negatively correlated with counterfactual thinking direction. In other words, upward counterfactual thinking calls forth negative emotional response while downward counterfactual thinking provokes positive (or slightly negative) emotional response (Markman *et al.,* 1993; Medvec *et al.,* 1995). Kasimatis and Wells (1995) highlighted significant impact of personality dimensions upon counterfactual thinking. Specifically, traits such as optimism and self-esteem are determinants of mental simulation (Karter and Small, 2006). Highly self-esteem persons tend to do downward counterfactual thinking and pessimistic persons tend to apply upward factual thinking (Sanna, 1995). Furthermore, findings demonstrated prediction of counterfactual thinking directions and intensity by using positive personality traits such as self-esteem (Roese and Olson, 1995), optimism (Sanna, 1996), and perfectionism (Sirois *et al.,* 2010).

As far as agreeableness was concerned, our findings was not in agreement with study of Murphy (2005) and Allen *et al.,* (2013) who did not find significant relationship between agreeableness and counterfactual thinking. This occurred perhaps because of gaining less knowledge of this personality dimension. Allen *et al.,* (2013) suggested that agreeable persons experience greater negative emotions. Due to these findings, scholars should conduct further studies in this regard.

Additionally, there was significantly positive relationship between neurosis and all upward counterfactual thinking styles and therefore neurosis was regarded as predictor of these styles. According to Schultz, persons with neurosis have low self-esteem and show a sense of guilt. Moreover, Eysenck demonstrated that autonomic nervous system of neurotic personproduces extreme response to moderate stressors and any problems.

In accordance with Neo theory, norm theory, and functionalmodel of counterfactual thinking, neurosis provokes negative emotions and therefore neurotic persons do upward counterfactual thinking more likely. The higher level of neurosis is indication of tendency for greater psychological distress. Anxious individuals do more thinking about alternative options producing more satisfactory outcomes. As Reed and Derryberry (1995) pointed out, neurotic individuals feel greater concern over negative information because of low self-image. So, they tend to do upward counterfactual thinking because a difference lays between their ideal self and real self.

Findings of this study are consistent with studies of Murphy (2005) and Allen *et al.*, (2013). Similarly, Sanna (2006) revealed positive correlation between neurosis and upward (self-referent and no-referent) counterfactual thinking. Also, Allen et al. (2013) observed significant correlation between personality dimensions (neurosis and extraversion) and counterfactual thinking.

Conversely, conscientiousness and extraversion were not significantly interrelated with counterfactual thinking. According to McRae and Custa (1992), conscientious individuals go through active process of decision making, organization, and fulfillment of duties. This lack of correlation may occur as the result of their balance for thinking about alternative options.

Since extrovert individuals have sense of optimism and there is not significant relationship between extroversion and downward counterfactual thinking, scholars should conduct further studies about extroversion in sports with introvert athletes.

To sum up, personality dimensions are significantly correlated with counterfactual thinking. Persons with openness and agreeableness personality do downward counterfactual thinking. Accordingly, they can provoke positive emotions and achieve success in future. Conversely, highly neurotic individuals apply upward counterfactual thinking and so they experience negative feelings and fear failures in future. Coaches are expected to predict possible defeats of their athletes by gaining awareness of their personality traits and to make alteration in their counterfactual thinking by implementing cognitive restructuring techniques.

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