Positive emotions’ influence on attitude toward change, creative thinking and their relationship with irrational thinking in Romanian adolescents

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Abstract

The purposes of the present study were: (1) to explore whether or not the positivity ratio (the ratio between positive and negative emotions) can predict irrational thinking and (2) to investigate the influence of positive emotions on creative thinking and adolescents’ attitudes concerning change. The research sample consisted of 93 adolescents. The results indicate that the positivity ratio predicts only the global evaluation of personal values, but not the other dimensions of irrational thinking. Positive emotions determine better results with regard to the three dimensions of creative thinking: fluency, flexibility and originality than those obtained in the neutral condition. There weren’t significant differences between negative and positive emotions with regard to the creative thinking test. Also, the valence of induced emotions influenced dispositional attitudes toward change. Specifically, people who received positive emotions manipulation showed less resistance to change than negative and neutral groups. The implications of these findings for fostering change in psychotherapy are discussed.

Keywords: positivity ratio, positive emotions, irrational thinking, creative thinking, resistance to change

1. Introduction

The Broaden and Build Theory of Positive Emotions (Fredrickson, 2001) represents the main theoretical framework which sustains the research ideas contained in this paper. This theory advances two hypotheses: 1) the broaden hypothesis which states that positive emotions broaden individuals’ thought and action repertoires, and 2) the build hypothesis which advocates the long-term effects of positive emotions. In other words, this theory asserts that positive emotions are responsible for the expansion of people’s attention (determining the global visual processing of stimuli; Gasper & Clore, 2002), thinking (Johnson et al., 2010; Fredrickson & Branigan, 2005; Fredrickson & Joiner, 2002) and behaviours (Johnson & Fredrickson, 2005). Even though positive emotions are short-term affective states, they have long-term effects, specifically determining significant increases in individuals’ physical, psychological, cognitive and social resources (Fredrickson, 2001). This theory is complemented by the dopaminergic theory of positive affect, which helps us to understand the effects of positive affect on flexibility, thinking, and behaviour (Ashby et al., 1999). According to this neuropsychological theory, when individuals experience positive affective states, there are dopamine releases in certain cerebral areas, and this neurotransmitter is responsible for increases in performances with regard to many cognitive tasks involving the working memory, the episodic memory and creative thinking. The idea that positive emotions foster the expansion of cognitive repertoires and creative thinking is not only sustained by these two theories, but also by empirical studies. The existing data propose that mild positive emotions enable cognitive flexibility and “…tend to promote exploration and enjoyment of new ideas and possibilities, and new ways of looking at things, especially in safe, enjoyable situations” (Isen,
2008, p.569). In a meta-analytic study which integrated many studies on mood and creativity, it was found that positive emotions compared to neutral states determine a higher creativity, but no significant differences were identified between positive and negative affect (Baas et al., 2008). It was suggested that positive mood reduces perseveration (it increases the ability to switch the cognitive sets when the context requires it), but that it also increases distractibility (it reduces the ability to focus on a task when there are distracting stimuli) (Dreisbach & Goschke, 2004). These theoretical and empirical data persuaded us to attempt to verify the influence of positive emotions on creative thinking on the part of the Romanian population, given that the cultural background has a significant influence on creativity. We wanted also to see if positive emotions produce less inclination to resist change, on the assumption that, if positive emotions determine the broadening of behavioural repertoires, these affective states will reduce individuals’ dispositional inclination to resist change. We didn’t find empirical data in order to test this hypothesis.

Concerning the relationship between irrational thinking and emotions, the cognitive-behavioral orientation asserts that emotions, whether positive or negative, adaptive or maladaptive, are produced by an individual’s cognitions (David, 2006). In spite of this view, the literature sustains the view that the relationship between cognition and emotion is not unidirectional. These two psychic phenomena are indubitably related in the sense that emotions - either positive or negative - can be the cause of particular cognitive-behavioral processes as well as their consequences (Huppert, 2005). Similarly, Clore & Ortony (2008) conceptualised that emotions are the results of iterative appraisal processes of the affective reactions. For this reason, we tried to see if the ratio between positive and negative emotions (the positivity ratio) can predict the level of irrational thinking. We based our hypothesis on recent findings that suggest that people with a positivity ratio higher than 3 to 1(3 positive emotions for 1 negative) tend to be associated with flourishing mental health (Fredrickson & Losada, 2005) and, by analogy, with lower levels of irrational thinking.

2. Method

2.1. Participants

We used a convenience sample of 93 Romanian white high school students who are studying at “Unirea” National College, Focsani. The age range was 16 to 19 years (X=17.47, SD=0.79); 38 (40.9%) were males, 55 (59.1%) were females, 63 were from rural habitats and 30 were from urban habitats.

2.2 Procedure

At the beginning, we described this study as a scientific investigation into “the styles of thinking”. The information made clear that the study was being conducted by university researchers, that the results would be confidential, and that the participants had the choice as to whether or not to participate. The researchers specified that the participants could give up participating in this research at any moment. Then the participants completed the scale intended to evaluate their positivity ratio and the measure of irrational thinking. After a 10 minute break, the subjects were randomly distributed into three different groups. The emotions induction procedure then followed: the participants from the first two groups were asked to write about an emotionally charged personal experience (positive or negative) on a blank A4 sheet, with no time limit specified (as was done by Kosnes et al., 2010). An advantage of this method is that it permits the participants to describe their own experiences and it decreases the potentially mistaken effects of the content in terms of the emotion-inducing procedure. The participants from the neutral group read a one page long text about a sculpture of the head of Dante Alighieri and were then were asked to grade the text from 1 to 10. Then all the participants had to complete the task required by the creative thinking test and to respond to the questionnaire designated to measure their dispositional attitudes towards change. At the end, the researchers told the adolescents who were participants in the research the real hypotheses of the study, the reasons of blinding their expectations and offered them a debriefing which contained the entire description of this investigation and its hypotheses.

2.3 Measures

We used the following instruments.

The Positive and Negative Affect Schedule (PANAS) – Short Form (Thompson, 2007) is a 10-item version with 5-item PA (positive affect) and 5-item NA (negative affect). The possible answers ranged from 1 = never to 5 =
always, which assesses the degree of generally experiencing the 10 emotions included in the scale. We calculated the positivity ratio by dividing the total scores obtained by the subjects with regard to the PA scale by the total scores for the NA scale. Also, with regard to obtaining the positivity ratio, we transformed the original numbering of the scale from 0= never to 4 = always. The Cronbach's alpha for the NA was $\alpha = 0.69$ and for the PA it was $\alpha = 0.67$.

The Romanian version of the General Attitude and Beliefs Scale (GABS) - Short Form (David, 2006) has twenty-six items ranging from 1 = strongly against to 5 = strongly agree, and assesses the general rational and irrational evaluative cognitions. This measure includes two main subscales: the Rationality Scale and the Irrationality Scale. In its turn, the Irrationality Scale includes six subscales: 1) the global evaluation of personal value, 2) the need for achievement, 3) the need for approval, 4) the need for comfort, 5) the absolute requirement of justness and 6) the global evaluation of the others. The Cronbach's alpha for the GABS-SF is $\alpha = 0.83$. The Rationality Scale includes 4 items and its Cronbach's alpha is $\alpha = 0.32$. The Irrationality Scale is a composite of the other 22 items, and its Cronbach's alpha is $\alpha = 0.84$.

The Resistance to Change Scale (Oreg, 2003) has seventeen items ranging from 1 = strongly disagree to 6 = strongly agree, which assesses an individual’s dispositional inclination to resist change. This scale includes four distinct subscales: routine seeking, emotional reaction to imposed change, cognitive rigidity and short-term focus. In the present study we considered the general inclination to resist change, whose score is given by the mean of the subjects’ answers to all the items of the scale. The Cronbach's alpha obtained for our sample to their general resistance to change is $\alpha = 0.78$.

The Cane Test (Stoica–Constantin & Caluschi, 2005) assesses the following three dimensions of creative thinking: fluency, flexibility and originality. The total score for the general level of creative thinking was obtained through the addition of the numbers which indicates the class for the scores obtained with regard to the three factors. The requirement of this test is: “List all the uses of a normal wood cane which has one curved end and a nail at the other”. The subjects had to list all the possible usages of the cane within a period of five minutes. For scoring the results of the subjects we used the evaluation protocol and the gauge of the test for the Romanian population. We calculated the values of the general level of creative thinking and we computed the final grades obtained by the subjects to the three dimensions of creative thinking.

3. Results

In this section, we present the results of the statistical tests used to check the confirmation of the hypotheses: linear regression and One Way Anova. Regression analysis was used in order to describe the relationship between the positivity ratio and the rational and irrational thinking for predicting through a regression equation using the score obtained by an individual in terms of rational and irrational thinking, by knowing his positivity ratio. We used the One Way Anova to test the differences between the means of the three independent groups with regard to the emotions manipulation variable obtained in terms of the dependent variables: resistance to change, general creative thinking and its three dimensions: fluency, flexibility and originality.

The results (Table 1) show that the positivity ratio (the ratio between positive and negative emotions) predicts only one dimension of irrational thinking, namely the global evaluation of personal value. The results of the linear regression were statistically significant, $F \left( 1, 91 \right) = 12.081$ at $p < 0.05$, and showed that the positivity ratio is negatively associated with the global evaluation of the personal value. The regression equation obtained is: global evaluation of personal value $= 10.856 + (-0.894) \cdot \text{(positivity ratio)}$. The value of $R^2$ is 0.117, which means that the positivity ratio explains 11.7% of the global evaluation of the personal value variance. This represents a medium size of effect. Therefore the results show that there is a negative association between these two variables ($r=-0.34$) and this means that a person who has a lower positivity ratio will obtain a higher score in terms of the global evaluation of personal value. In other words, the more an individual is experiencing fewer positive emotions in comparison with negative ones, the more he will be inclined to evaluate himself in global terms. The rational thinking is not predicted by the positivity ratio. Also, irrational thinking and its other 5 dimensions (the need for achievement, the need for approval, the need for comfort, absolute requirement of justness and global evaluation of the others) were not predicted by the positivity ratio.
Table 1. Results for regression analysis on predicting the global evaluation of personal value from the positivity ratio

<table>
<thead>
<tr>
<th>Predictive variable</th>
<th>R</th>
<th>R²</th>
<th>β</th>
<th>B</th>
<th>SE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positivity ratio</td>
<td>.342</td>
<td>.117</td>
<td>-.342</td>
<td>-.894</td>
<td>.257</td>
</tr>
</tbody>
</table>

One Way Anova was used to analyse the influence of the emotion manipulation variable on individuals’ dispositional inclination to resist change. The results showed that there are statistically significant differences dependent on the variable emotion manipulation concerning the individuals’ inclination to resist change ($F(2, 90) = 6.820$) (Table 2).

Table 2. One-Way ANOVA for the means comparison at the variable dispositional inclination to resist change dependent on the variable emotion manipulation

<table>
<thead>
<tr>
<th>Variance source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3.492</td>
<td>2</td>
<td>1.746</td>
<td>6.820</td>
<td>.002</td>
</tr>
<tr>
<td>Within groups</td>
<td>23.042</td>
<td>90</td>
<td>0.256</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>26.534</td>
<td>92</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to verify which of the three groups of the emotions manipulation variable show significant differences, we used the post hoc test $t$ Tukey (Table 3). The individuals who received a positive emotions manipulation showed less inclination to resist change than those who were negatively manipulated ($Tukey t = 2.90, p < 0.05$). Also the group that received positive emotion manipulation had a lesser inclination to resist change than the neutral group ($Tukey t = 3.42, p < 0.05$). There were no differences between the neutral group and those individuals who received negative manipulation.

Table 3. Results of the post hoc $t$ Tukey test

<table>
<thead>
<tr>
<th>Positive emotion manipulation -1</th>
<th>Negative emotions manipulation - 2</th>
<th>Neutral group - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(M = 2.89)</td>
<td>-</td>
<td>2.90*</td>
</tr>
<tr>
<td>2(M = 3.27)</td>
<td>2.90*</td>
<td>3.42*</td>
</tr>
<tr>
<td>3(M = 3.34)</td>
<td>-</td>
<td>5.16</td>
</tr>
</tbody>
</table>

* $p<0.05$

To test if the induced emotions lead to different performances in terms of general creative thinking and its three dimensions, we also used the One-Way Anova. The results indicated that general creative thinking significantly differs according to the type of emotion induced - positive, negative or neutral ($F(2.90) = 3.123, p<0.05$). The induction of emotions determined significantly different levels with regard to the fluency of creative thinking ($F(2.90) = 3.637, p<0.05$). Also, there were significant differences among the three groups (positive, negative and neutral) concerning the flexibility of creative thinking ($F(2.90) =3.176, p<0.05$). Finally the originality of creative thinking significantly differs according to the type of emotion induced ($F(2.90) = 4.565, p<0.05$). We used independent sample $t$ tests for comparing the three groups with regard to the emotions manipulation variable, two by two, with the purpose of verifying which of the three groups (positive, negative and neutral) are different (Table 4). The data indicates that there is a statistically significant difference in the scores for general creative thinking at $p < 0.05$ ($t (60) = 2.558$) between induced positive emotions and the neutral group; the level of the general creative thinking is significantly higher in terms of the subjects who received positive emotions manipulation ($M = 5.84$) than on the part of the subjects from the neutral group ($M =4.61$). Also, the results show that the fluency of creative thinking is significantly higher for those subjects who received positive emotions manipulation ($M = 8.06$) than those included in the neutral group ($M = 6.16$) - ($t (60) = 2.431 p < 0.05$). The results indicate that there is a statistically significant difference in terms of the scores with regard to the flexibility of creative thinking at $p < 0.05$ ($t (60) = 2.720$) between the positive emotions induction group and the neutral group. The flexibility of creative thinking is significantly lower with regard to the subjects from the neutral group ($M = 4.71$) than the level of the subjects from the positive emotions induction group ($M = 6.58$). The originality of
creative thinking is significantly higher for those participants who received a positive emotions manipulation (M=57.06) than for those from the neutral group (M=36.13) at p < 0.05 (t (60) = 3.098).

Table 4. The results of the independent sample t tests destined to compare the means of the neutral group with the means of the positive emotion induction group in terms of the variables general creative thinking, fluency, flexibility and originality of creative thinking

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>yncneulF</td>
<td>31</td>
<td>8.06</td>
<td>3.47</td>
<td>2.43</td>
<td>60</td>
<td>.016</td>
</tr>
<tr>
<td>snoitome evitisoP</td>
<td>31</td>
<td>8.06</td>
<td>3.47</td>
<td>2.43</td>
<td>60</td>
<td>.016</td>
</tr>
<tr>
<td>puorg lartueN</td>
<td>31</td>
<td>8.06</td>
<td>3.47</td>
<td>2.43</td>
<td>60</td>
<td>.016</td>
</tr>
<tr>
<td>ytilibixelF</td>
<td>31</td>
<td>6.16</td>
<td>2.63</td>
<td>2.72</td>
<td>60</td>
<td>.009</td>
</tr>
<tr>
<td>snoitome evitisoP</td>
<td>31</td>
<td>6.58</td>
<td>3.06</td>
<td>2.72</td>
<td>60</td>
<td>.009</td>
</tr>
<tr>
<td>puorg lartueN</td>
<td>31</td>
<td>6.16</td>
<td>2.63</td>
<td>2.72</td>
<td>60</td>
<td>.009</td>
</tr>
<tr>
<td>ytilanigirO</td>
<td>31</td>
<td>4.71</td>
<td>2.30</td>
<td>3.09</td>
<td>60</td>
<td>.003</td>
</tr>
<tr>
<td>snoitome evitisoP</td>
<td>31</td>
<td>56.06</td>
<td>32.92</td>
<td>3.09</td>
<td>60</td>
<td>.003</td>
</tr>
<tr>
<td>puorg lartueN</td>
<td>31</td>
<td>36.13</td>
<td>18.23</td>
<td>3.09</td>
<td>60</td>
<td>.003</td>
</tr>
</tbody>
</table>

There were also significant differences between the negative emotion manipulation (M=8.23) and the neutral group (M=6.16) at p < 0.05 (t (60) = -2.470), in the sense that the neutral group showed lower fluency in terms of creative thinking. Also the flexibility in terms of creative thinking is significantly lower on the part of those participants from the neutral group (M=4.71) than those who received a negative emotions manipulation at p < 0.05 (t (60) = -2.156). We didn’t find statistically significant differences between positive and negative emotions in terms of general creative thinking and its three dimensions: fluency, flexibility and originality.

4. Discussion

This study analyses the effects of positive emotions on creative thinking, as well as their influence on individuals’ dispositional inclination to resist change. We also analysed the relationship between the positivity ratio (the ratio between the positive and negative emotions) and irrational thinking and its six dimensions: 1) the global evaluation of personal value, 2) the need for achievement, 3) the need for approval, 4) the need for comfort, 5) the absolute requirement of justness and 6) the global evaluation of others. The results show that the positivity ratio doesn’t predict the level of overall irrational thinking and its five dimensions. These data are consistent with the cognitive–behavioural paradigm which states that emotions are determined by cognitions and not on the reverse (David, 2006). It was only found that the positivity ratio is negatively associated with the first dimension of irrational thinking, namely the global evaluation of personal value. This means that a person who has a greater positivity ratio (that is, he experiences more positive emotions than negative ones) will tend to globally evaluate his personal value to a lesser extent.

Concerning the relationship between positive emotions and creative thinking, it was found that people who were positively manipulated showed higher performances in terms of general creative thinking and its three dimensions: fluency, flexibility and originality, than did the neutral group. It was also found that there were no differences concerning the performances with regard to creative thinking and to its three dimensions, between the group that received a negative mood induction and the group that was positively manipulated. These results are consistent with several previous pieces of research (Bass et al., 2008). We could explain the missing differences between positive and negative emotions regarding creative thinking by presenting the point of view advanced by Gable & Harmon-Jones (2010). These authors believed that the motivational dimension of affect and not its valence, represents an important variable which influences the expansion or the narrowing of the cognitive repertoires in positive or negative affect conditions. Specifically, the negative or positive affect which is low in motivational intensity will expand the cognitive repertoires, whereas the affect (either positive or negative) which is high in motivational intensity will be responsible for narrowing cognition and attention. Further investigations into creative thinking could be done by combining these two dimensions: the valence and the motivational intensity of affect.
In the light of the Broaden and Build Model of Positive Emotions (Fredrickson, 2001) which advocates that positive emotions expand cognition and behaviour, we hypothesized that positive emotions will determine a lesser inclination to resist change. The data showed indeed that people who were positively manipulated, tend to resist change to a lesser extent than those individuals who received a negative or a neutral induction of emotions. There weren’t differences between the neutral group and the group that received negative emotions manipulation concerning the individuals’ inclination to resist change.

The results obtained through this study represent more empirical support for the utility of psychotherapeutic interventions with the purpose of stimulating the experiencing of positive emotions in a therapeutic context, in order to facilitate the individual’s change. As some studies have shown, the psychotherapeutic interventions designed to stimulate the experience of positive emotions using positive psychology techniques determine the reduction or the alleviation of depressive symptoms (Sin & Lyubomirsky, 2009; Seligman et al., 2006). Also, Tashiro & Frazier (2007) concluded that it could be a good idea to stimulate the experiencing of positive emotions in the therapeutic context in order to generate change. After that, these authors found that the couples who experienced positive emotions tended to present maladaptive cognitions and behaviours to a lesser extent. Why should we stimulate the experiencing of positive emotions in order to foster therapeutic change? We could do this because, as the data of the present study showed, inducing positive emotions reduces people’s inclination to resist change and facilitates the fluency, the flexibility and the originality of their creative thinking. We suppose, in the light of the present findings, that stimulating positive emotions in a therapeutic context, and increasing the positivity ratio (the ratio between the positive and negative emotions experienced by an individual), could help the clients to accept changes more easily.

We could hypothesize that positive emotions, by facilitating creative thinking, could help individuals to quickly find new, original and many ideas to solve their problems. Therefore, by increasing the positivity ratio in the therapeutic context, it will help clients to avoid the tendency to globally evaluate their personal value. Giving up to this kind of irrational thinking could help the therapeutic process because the individuals will be able to evaluate their failures or dissatisfactions in specific domains, and not by extending them globally to their personal value.

5. Conclusion

The purposes of this study were: (1) to explore whether the positivity ratio (the ratio between positive and negative emotions) can predict irrational thinking and (2) to investigate the influence of positive emotions on creative thinking and adolescents’ attitudes concerning change. The results showed that the positivity ratio predicts only a dimension of irrational thinking, namely the global evaluation of personal values. Because we found a negative association between the positivity ratio and the global evaluation of personal value, we showed that people who present a higher positivity ratio tend to evaluate themselves globally to a lesser extent. Another purpose of this research was to test the influence of induced positive emotions on creative thinking and on individuals’ dispositional inclination to resist change in comparison with a negative emotions induction and a neutral state. Positive emotions determined better results with regard to the three dimensions of creative thinking: fluency, flexibility and originality, than those obtained in the neutral condition. There weren’t significant differences between negative and positive emotions with regard to the creative thinking test. Also, the valence of induced emotions influenced dispositional attitudes toward change. Specifically, people who received positive emotions manipulation showed less resistance to change than those in the negative and neutral groups. These findings encourage us to engage in further research to investigate the generator role of positive emotions in terms of therapeutic change.

Acknowledgements: this work was partially supported by the European Social Fund in Romania, under the aegis of the Managing Authority for the Sectoral Operational Programme for Human Resources Development 2007-2013 [grant POSDRU/88/1.5/S/47646]. We would like to thank Professor Dr. A. T. Beck, Daniel David and Dr. Shaul Oreg for allowing us to use the scales GABS – SF and the Resistance to Change Scale. We would like to thank also the students and colleagues from the “Unirea” National College Focşani and from CJRAE Vrancea for the support given in terms of carrying out this study.

References


