

Preventing Worry and Rumination by Induced Positive Emotion

Fatemeh Bahrami, Rahim Kasaei, Ahmadreza Zamani¹

Department of Counseling, University of Isfahan, Iran, ¹Department of Community Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Correspondence to:

Associate Prof. Ahmadreza Zamani,
Department of Community Medicine, Isfahan
University of Medical Sciences, Isfahan.
E-mail: zamani@med.mui.ac.ir

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ABSTRACT

Background: This study aimed to test the hypothesis that positive emotion can quell or undo the lingering worry and rumination following induced negative emotion.

Methods: 32 female students in grade 1 of high school were randomly recruited and assigned in two experimental and control groups. They completed questionnaires in a pretest that are listed herewith: (1) Rumination questionnaire; (2) Two scales of the big five factorial questionnaire (extraversion – introversion); (3) MMPI₂; (4) Penn-state worry questionnaire. Then for the first group a sad movie, for the second group a cheerful movie, and for the third group a neutral movie was played, and the fourth group remained without intervention. Next day, all the group members completed the worry and rumination questionnaire again. Research findings were analyzed using covariance analysis and multivariate analysis of variance (MANOVA).

Results: Those participants whose attention was turned toward the cheerful movie recovered from negative emotions (rumination and worry) more than those who saw either a neutral or sad movie or remained without intervention.

Conclusions: Positive emotion is effective on negative emotion like worry and rumination. This effect is called the undoing effect of positive emotions

Keywords: Induced emotion, negative emotion, positive emotion, rumination, worry

INTRODUCTION

Emotions represent an internal data that influence motivations and behavior. Indeed, emotion may be more primitive than cognition, and empirical data suggests that it is controlled by subcortical brain structures. It is well-established that emotions can affect many parts of the cognitive process, including attention-bias, memory,^[1,2] judgment, and decision-making.^[3]

Positive emotions, positive moods, and positive sentiments carry multiple, inter-related benefits. First, these good feelings alter people's mindsets. Experiments have shown that an induced positive affect widens the scope of attention,^[4,5]

broadens behavioral repertoires,^[4] and increases intuition^[6] and creativity.^[7] Second, good feelings alter people's bodily systems. Experiments have shown that induced positive affect, not only speeds the recovery from cardiovascular accidents following the effects of a negative effect,^[8] but also alters frontal brain asymmetry,^[9] and increases immune function.^[9] Third, good feelings predict salubrious mental and physical health outcomes. Prospective studies have shown that frequent positive affects predict (a) resilience to adversity,^[10] (b) increased happiness,^[10] (c) psychological growth,^[10] (d) lower levels of cortisol,^[11] (e) reduced inflammatory responses to stress,^[11] (f) reductions in subsequent-day physical pain,^[12] (g) resistance to rhinoviruses,^[13] and (h) reductions in stroke,^[14] and fourth, perhaps due to reflecting these effects in combination, good feelings may predict people's longevity. Several well-controlled longitudinal studies document a clear link between frequent positive affect and longevity,^[15-17] which is at least partially mediated by positive emotions, downregulating the effect of excessive or inappropriate sympathetic activation (stress, anxiety, or anger).^[18]

Ruminative response to negative mood

Ruminative response to negative mood and other depressive symptoms are thoughts and behaviors that repetitively focus the individual's attention on his or her negative feelings and the nature and implications of those feelings.^[19] Although many people feel compelled to ruminate about themselves and their problems when experiencing dysphoria and depression, converging empirical evidence suggests that such a coping style is associated with numerous deleterious outcomes. The most powerful evidence for the adverse effects of rumination comes from experimental studies that have recruited naturally dysphonic participants and induced them to ruminate in the laboratory (i.e., by instructing them to focus on their feelings, physical symptoms, and their characteristics) and then assessed these participants' moods, cognitions, and behavior immediately after they have ruminated.^[20] However, individual differences exist in the way people regulate their emotion. Women ruminated more than men.^[19] In addition, more concurrent depressive symptomatology, a large number of stressors, less perceived social

support, optimism and neuroticism are related to more rumination.^[20] Other influences contributing to preserve ruminative self-focused processing and maintain emotional disorder consist of personality traits such as dispositional self-focus attention,^[21] and factors such as neuroticism, which may be related to the accessibility of negative self-knowledge and preference of emotion-focused coping strategies.^[22]

Pathological worry

Repetitive negative thinking is a feature of most types of psychological dysfunctions. Depression is associated with rumination and anxiety for worry. Wells^[23,24] suggested that worry can be a form of coping. Even as, Brokovec and Inz^[25] have emphasized that worry can serve as a cognitive avoidance function, which individuals with generalized anxiety disorder (GAD) use, to distract attention from a more distressing image. Davey^[26] views worrying as involved in problem-solving under a condition of ascertaining. Worry has been defined by Wells^[27] as a chain of catastrophic thoughts that are predominantly verbal. It consists of contemplation of potentially dangerous situations and of personal coping strategies. It is intrusive and controllable, although it is often experienced as uncontrollable. Worrying is associated with a motivation to prevent potential danger. Worrying may itself be viewed as a coping strategy, but can become the focus of an individual's concern.^[1]

Physiological undoing

Beyond providing pleasant distractions, which put people's minds at ease, positive emotions also have a unique capacity to put people's bodies at ease. Negative emotions such as anger, fear, anxiety, even sadness and crying, arouse people's autonomic nervous systems, producing increases in heart rate, vasoconstriction, and blood pressure, as well as other changes.^[28-31] Laboratory experiments have shown that experiences of positive emotions can quell or undo the lingering cardiovascular effects of these negative emotions. In comparison with neutral distractions and sadness, positive emotions produce faster returns to baseline levels of cardiovascular activation, following negative emotional arousal.^[32,33]

It is important to note that the personal resources accrued through positive emotions

are durable; they outlast the transient emotional states that lead to their acquisition. Consequently, the frequent incidental effect of experiencing a positive emotion is an increase in one's personal resources. Therefore, through experiences of positive emotions, people may literally transform themselves, becoming more creative, knowledgeable, socially integrated, healthy, and resilient. These various resources function as reserves that can be drawn on throughout life, to improve coping and odds of survival. Indeed, a study of the elderly found that those who expressed the most positive emotions in early adulthood lived up to 10 years longer than those who expressed the least positive emotions.^[15,18]

Study aims

To begin with, we have argued that numerous studies showing positive emotion can have an effect on an individual's function, but the present research wants to study the effects of positive emotion in preventing pathological worry and rumination from a metacognitive perspective. According to the metacognitive model, worry and rumination are maladaptive coping styles that cause emotional dysfunction and pathology and have more far-reaching deleterious effects associated with elaboration of self-knowledge and blocking adaptive restructuring. This research aims to study whether positive emotion decreases self-focused attention on negative emotion, as well as maladaptive coping strategies (worry and rumination). For this purpose, negative emotion was induced by manipulation (giving an examination).

The major hypotheses in this study are as follows:

1. Positive emotion reduces previously induced worry
2. Positive emotion reduces previously induced rumination

METHOD

Research design and participants

This is a semi-experimental research. The plan which was used for this research was pre- and post-test along with the control group. The sample of research was a randomly selected cluster from girls in the first year of high school.

In this research, four groups of subjects participated, and each one included eight individuals. That is the appropriate size of a sample for working with a group and the process of research, because the researcher should listen to the subjects and needs to give individual attention, which is time-consuming. There were two experimental groups and two control groups. The subjects did not know that they were being studied (the simple blind), while the researcher knew about the research situation and it could bias the results. The attrition rate was zero.

Following specifying subjects in each group, questionnaires of rumination, Penn-state worry, MMPI2, and two scales from the big five-factorial questionnaire (neuroticism and intervention) were completed.

Procedures

The subjects were prepared for the anxiety inducing program and they were told that the next day they would have to present an important lecture for 15 minutes, about their favorite major in which they would like to continue their studies; also, they would be evaluated by the counselor and after the lecture, the results of this program would have a significant contribution in determining their field of study in the next year.

Following inducing anxiety, for the individuals in the first group a sad movie and for the individuals in the second group a cheerful movie was displayed. It is worth mentioning that the movies were chosen after asking the opinions of a lot of students and movie experts.

In the same way, for the participants in the third control group a neutral movie concerning Chinese flower making instruction was displayed and for the participants in the second control group no movie was displayed.

The next day following anxiety induction and a movie display, all the groups completed the worry and rumination questionnaires.

Measures

In general, the employed questionnaires included the following issues:

1. Researcher-made Rumination Questionnaire (RQ): It was specially made by the researcher to assess the level of rumination, particularly in connection with the examination. Validity of this test was confirmed by some of the

consultation and psychology professors of the Isfahan University, and following conduction of the test on the 32 subjects, the reliability (stability) of the test was obtained through Cronbach's alpha, which equaled 0.89.

2. Penn-state worry questionnaire (PSWQ): PSWQ was conducted by Borkovec *et al.* Based on the re-test stability of the questionnaire, it had correlation with several psychometric standards. Giving the questionnaire to a group of old adults, with a variance of 57%, in a sample of 115 individuals, and to a group of 183 young adults, with a variance of 70%, the assessment by factor analysis showed a factorial (0.66 – 0.86), strong enough in both specimens. Also, the mean convergent validity showed good correlation with the worry and anxiety assessment ($r=0.46, 0.83$).^[34]
3. Minnesota Multiphasic Personality Inventory-Second Edition (MMPI-2): The MMPI-2 is a 567 item self-report measure of personality functioning and psychiatric symptoms. The MMPI-2 has a reported test-retest reliability coefficient of 0.74 and internal consistency correlation of 0.87. It was deemed to have good discriminate validity, with effectiveness in distinguishing between psychiatric and control groups, neurotic and psychotic groups, and depression versus anxiety.^[35]
4. NEO Five Factor Inventory (NEO-FFI): The personality was assessed using NEO-FFI, which has 60-items. It is the short version of the 240-item NEO Personality Inventory Revised (NEO PI-R), which measures the Big Five dimensions of personality: Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C). In the current study, Cronbach's alpha coefficients for the NEO-FFI were 0.90, 0.79, 0.74, 0.74, and 0.85, respectively.^[36]

In this research due to the necessity of issues, only two introversion and extraversion scales were used. MMPI-2 and the large factor test were used for controlling the effect of the subjects' personality traits and problems on the depended variable effects.

Statistical analysis

Results of this research were analyzed using the SPSS.13 software. For this purpose and based on

the research hypotheses, first, the mean, standard deviation, and other descriptive indices of research were computed. To study the effect of positive and negative emotion induction, the MANOVA analysis was employed. In order to compare worry and rumination scores of subjects, based on experiment and control groups, covariance analysis was used. In this study, it was aimed to determine the effects of positive and negative emotion on one clinical sample, so the pathological traits in the subjects were controlled using MMPI2. As mentioned earlier, rumination and worry were related to some individual traits such as neuroticism and self-focused attention (introversion),^[21,22] so these traits were controlled by using the factors of the NEO test, and they were also used for controlling differences related to gender; only girls were selected as subjects.

RESULTS

Results concerning the descriptive statistics have been shown in Tables 1 and 2 and Figures 1 and 2.

Hypothesis of this research studies the effect of inducing positive and negative emotions on worry and rumination caused by previous negative emotions (anxiety).

Results of MANOVA show that the differences among the four groups with regard to worry ($F=8.17, P<0.01$) and rumination ($F=12.28, P<0.01$) are significant.

Table 2 shows paired differences between mean score of groups in post-test worry following controlling pre-test and personality traits scores.

As Table 3 indicates, no significant differences can be detected in the level of rumination between experimental group 1 (group of negative emotion induction through sad movie) and the two control groups ($P>0.05$). However, with experimental group 1 (positive emotion induction through a cheerful movie) a significant difference is evident ($P<0.01$). Between experimental group 2 and the two control groups, a significant difference can be seen in the level of rumination ($P<0.01$). This finding indicates that high-emotion induction by a cheerful movie has been able to considerably decrease the level of the subject's rumination. Inducing a high mood can decrease the effects of the previous low mood induction, and prevent the maintaining and recurrence of the previously induced negative mood.

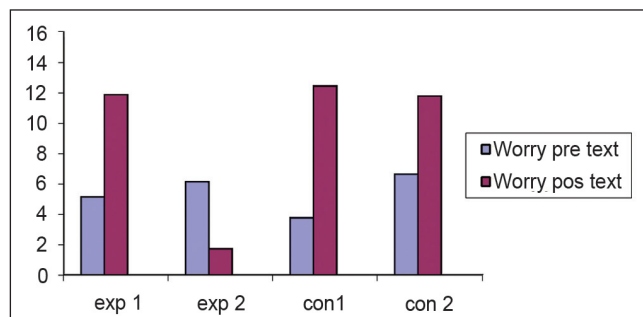


Figure 1: Bar mean diagram of remission of worry scores of subjects in pre-test and post-test

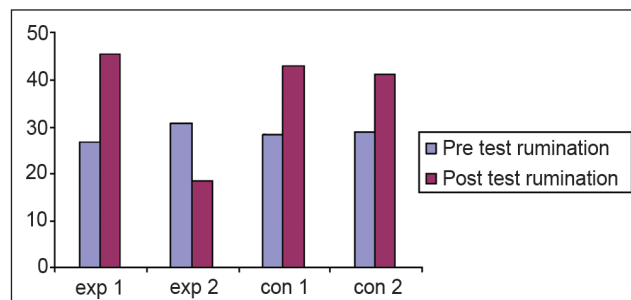


Figure 2: Mean bar-diagram of remission of rumination of subjects in the pre- and post-test

Table 1: Mean and standard deviation of worry and rumination in pre-and post-tests

Group	Dependent variable	Rumination mean	Worry mean	Rumination standard deviation	Worry standard deviation
Exp 1	Pre-test rumination and worry	2.87	5.12	6.57	3.04
Exp 2		30.8	6.12	9.83	6.97
Con 1		28.25	3.75	6.27	2.60
Con 2		28.87	4.62	8.45	4.74
Exp 1	Post-test rumination	45.38	14.49	13.67	5.58
Exp 2	and worry	18.45	1.71	4.22	1.49
Con 1		42.87	12.41	10.98	5.10
Con 2		41.29	11.76	7.55	7.93

Con 1: Neutral movie; Con 2: Without intervention; Exp 1: Sad movie; Exp 2: Cheerful movie

Table 2: Paired comparison of the level of worry of subjects according to their participation in groups, at the post-test stage

Dependent variable	Base group	Comparison group	Mean difference	SD	P
Post-test worry	Exp 1	Exp 2	17.852	3.632	<0.0001
		Con 1	17.077	4.048	0.008
		Con 2	13.926	3.671	0.007
	Exp 2	Exp 1	-17.0852	3.632	<0.0001
		Con 1	-5.836	3.845	0.146
		Con 2	-3.926	3.583	0.208

Con 1: Neutral movie; Con 2: Without intervention; Exp 1: Sad movie; Exp 2: Cheerful movie

Table 3: Paired comparison of the level of rumination of subjects, according to their participation in groups at the post-test stage

Dependent variable	Base group	Comparison group	Mean difference	SD	P
Post-test Rumination	Exp 1	Exp 2	26.92	4.9	<0.0001
		Con 1	2.50	4.9	0.611
		Con 2	4.09	4.9	0.410
	Exp 2	Exp 1	-26.92	4.9	<0.0001
		Con 1	-24.42	4.9	<0.0001
		Con 2	-22.84	4.9	<0.0001

Con 1: Neutral movie; Con 2: Without intervention; Exp 1: Sad movie; Exp 2: Cheerful movie

It is worth mentioning that in all the analyses, the effects of the pre-test and personality variables have been controlled and none of the personality factors have been effective on the impact of the independent variable.

DISCUSSION

According to Fredrickson's broaden and build theory,^[32,10] unlike negative emotions, which narrow people's behavioral urges toward

specific actions that are life-preserving for human ancestors (e.g., fight, flight), positive emotions broaden people's thought action repertoires, encouraging them to discover a novel line of thought or action. A key incidental outcome of this broadened mind set is an increase in personal resources: As individuals discover new ideas and actions, they build their physical, intellectual, social, and psychological resources, which fuel brain development. Similarly exploration increases knowledge and psychological complexity.^[32,10]

Positive emotion broadens attention and cognition. Evidence supporting this claim comes from studies that have used global local visual processing paradigms to access biases in attention focus. Negative state-like anxiety, depression, and failure, predict local biases consistent with narrowed attention. However, positive states like well being and success predict global biases consistent with broadened attention.^[37,38] Other experiments have shown that people with positive emotion are more flexible and creative.^[7] In general terms, positive emotions enlarge the cognitive context, an effect linked to increase dopamine in the brain.^[39] If positive emotions broaden attention and cognition, enabling flexible and creative thinking, they should also facilitate coping with stress and adversity.^[39,40] According to Wells and Matthews' Self-Regulatory Emotional Function (S-REF) model^[23,24] attention strategies, apart from the worry-based (rumination) strategies, the rest are central to emotional dysfunction. These strategies are self-focused processes leading to maladaptive processing routines that contribute to problem resistance and stress vulnerability.^[1] Therefore, important therapeutic aims should increase execution of attention and processing and interruption of repetitive self-attention processing. The findings show that induced positive emotion can be regarded as an intervention for interrupting self-focused attention and modifying the previous negative emotion.

This study has some limitations, such as: The researchers knew that they were doing research and this awareness and the differences in their personality traits and reactions to the participants could influence the result. Also the event that occurred during the intervention could bias the result.

The findings of the current research suggest that if positive emotion was induced by a movie, music, sport, entertainment, social facilities and supports, social communication, and so on, we could significantly reduce negative emotion following pathological effects. Some people respond to negative emotion by rumination and worry that leads to a sustained negative mood. Positive emotions influence health,^[41] change attention from internal to external and new information, and broaden one's view, which provides a better solution to problems. These suggestions are

especially useful to females, who ruminate and worry more.^[42-44]

END NOTES

1. Part of this research was presented at the Thirty-Sixth Annual Congress of the European association for behavioral and cognitive therapies (EABCT), from September 20 to 30, 2006, at Paris, France.
2. When people used maladaptive coping strategies such as worry and rumination, then some pleasant events can divert their attention from their Internal selves to the external world (these additional words are correct) and can reduce negative emotions and maladaptive coping strategies. These findings confirm the attention training technique as a therapeutic interference for reducing self-focused attention that is responsible for recurrence and maintenance of depression and other emotional disorders.

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