

# The Effect of Episodic Future Thinking on Negative Emotions and its Mechanism

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**Abstract.** The research on the relationship of episodic future thinking (EFT) and reducing negative emotions is getting more attention from scholars. This paper first discusses the precondition of EFT, including scenario understanding, scenario memory, and positive bias in predicting future. Then the paper explores the influencing mechanism of EFT and the treatment, which are the effect on general anxiety disorder, helping retrieve positive memories, the use of RIF in memory retrieve, anxiety and rumination, as well as he worries about future. Finally, it mentions the limitation of the research, like the aging effect. Over all, the paper emphasizes on the other possible solutions of dealing with negative emotions in the future.

**Keywords:** Episodic Future Thinking; Negative Emotions; Influencing Mechanism.

## 1. Introduction

Stress becomes a universal problem today, and a particular cause of stress is worries about the future, like the coronavirus, global issues, or their own important issues, like school, finding a job, and various things for the rest of their lives. Mindfulness means considering the things happened in a positive way, and help people adjust their mental states to maintain a positive expectation about future, which could provide people with a solution to their worries about the future. If they could predict about the future positively, their pressure will decrease. (Cristina et al., 2001).

Episodic future thinking (EFT) is a more specific and feasible method in mindfulness. On the base of episodic memory, the concept of "episodic future thinking" was introduced to explain projecting oneself into the future, and experience an event in advance (Cristina et al., 2001).

There are many drug treatments for anxiety, and scholars have reached a consensus on non-drug treatment. Mindfulness is a typical non-drug therapy, and EFT is an important operational concept of mindfulness. Therefore, the purpose of this study is to explore the treatment and influence of EFT on anxiety. In the following paragraphs, I will talk about the precondition, influencing mechanism, and some other opinions about EFT and the reduce in pressure. (Wu et al., 2015)

## 2. Episodic Future Thinking and the Reduce of the Anxiety

People may predict future events in an episodic way, and the negative predictions could influence their mental state now, and that becomes pressure.

More positive EFT can help people reduce anxiety level. Vivid image simulation can better help people with mood disorder retrieve positive memories. Anxiety and depression were similarly associated with an increased tendency to anticipate the occurrence of negative events and to believe that future events will have negative outcomes. (Wu et al., 2015)

### 2.1 The Precondition of EFT and the Treatment of Anxiety

In building the future scene, people usually in the generated scenario details before obtaining general personal knowledge, the situation in the future event cluster, organized into reflects the higher order scheme, concepts, and the influence of emotional knowledge, and that for a future event associated with personal goals than has nothing to do with the personal goals of future events have a stronger sense of subjective "experience" beforehand.

Research on episodic future thinking has gathered pace in the last few years, continuing a trend that began about a decade ago (Schachter et al., 2017).

## 2.2 Scenario Understanding

Scenario understanding will help people better use episodic future thinking. Ji. et al. (2020) propose that two models can help enhance the use of scenario understanding: Sensory scaffolding and verbal scenario modality, which enable people to improve their ability to adapt to future, for example through preparedness for future threats and opportunities. Scaffolding is the way that supporting the participants and lead them to achieve certain task. This can also help them better understand the methods of using scenario memories. Modality effect is the higher recall levels for the last few items presented in aural forms rather than visually. These scenarios depict situations in everyday life that can trigger anxiety, but all end in a positive or well-meaning way.

Murphy et al. (2007) points out that scenario understanding can reduce anxiety through a positive EFT. He designed a control experiment, and find out that participants receive positive training have less negative interpretation to new things, and also have a lower anxiety level in a future social situation than the control group. Although higher anxiety symptoms were associated with lower situational ease of understanding, this negative effect was reduced in scenarios with picture scaffolds compared with no situational scaffolds. However, the absence of picture and sound scaffolds suggests a beneficial effect of picture scaffolds on situational simulation in anxious people.

Alden et al. (2004) consider scenario understanding can help social phobia patients to reduce pressure about future social interactions through positive EFT. He designed the case study, and conclude that framing methods, which is the special scenario understanding, can be useful for helping the cognitive process of social phobia patients, and also have the same level of anxiety anticipation with the normal people.

Above all, scenario understanding can be explained by two models: sensory scaffolding and verbal scenario modality, and help reduce anxious in future scenarios, as well as increase positive anticipation. Therefore, scenario understanding can improve the ability to use EFT and reduce pressure.

### *Scenario memory*

EFT depends on scenario memory, and simulate about future. Schachter et al.(2017) pointed out in their hypothesis of constructing scenario simulation that EFT requires flexible reorganization of the memory content, and experienced events to mentally simulate new events. The research points out that scenario memory is the factor of using EFT. Through the research on mechanisms of EFT, they discovered that EFT quite relies on episodic memory systems, which are thought to underlie a person's ability to recall past personal experiences. Thus, people who have deficits in acquiring specific episodic memories are also not able to use EFT well.

Hallford et al, (2017) proposed that the deficits in situational detail and specificity are distinct from each represent a common difficulty in scenario memory, and affect the simulation about future. The research designed the experiment, and proposed that the psychiatric diagnoses, particularly depression, bipolar disorder, and schizophrenia, have significant deficits in the mental ability to model specific and detailed future possible abilities. They are important for adaptive mental functioning.

In conclusion, Scenario memory is important part of EFT, which reflect in the difference of normal people and people with psychological disorders, who have difficulty in using scenario memories, and they also deficit in using EFT.

### *The positive bias in predicting future*

The positive bias means people tend to be optimistic in their predictions. One solution is to think about the future in two steps: first viswhich could be a condition for using positive EFT. Sjastad and Baumeister, (2021) proposed the two-step model: "What do I want?" and "How can I get there?" to form the anticipation about future.

According to the two-step model, since people tend to rely only on the first step of the intuitive prediction, the general prediction does not take into account how the goal will actually be achieved or possible errors, so generally optimistic prior discovery may occur. If so, the second step of slow reflection should revise the initial optimism and push the person to be more realistic. According to

this view, people may actually be better suited to arrive at a realistic and fairly accurate conclusion when they rely on intuition rather than deliberation.

The simulation of future sceneries can be a result of using postivie bias. Jing et al., (2017) point out that episodic memory processes involve producing alternative outcomes for expected future events. This hypothesis highlights the cognitive and neural similarities between episodic memory and episodic future simulations. If a person constantly has negative thoughts about the future, he will become maladaptive, especially given that ruminating about the future increases the estimate of the likelihood of an event. Thus, imagining fewer alternative outcomes in more specific, concrete details may be as beneficial to reducing pessimistic future predictions as obtaining more alternative outcomes, and more research should be conducted to clarify this. In addition, some types of change may be perceived as more manageable, increasing the likelihood of merely linking ideas to actual implementation actions.

Above all, positive bias in future can help the development of positive EFT, from the two-step model that explain people's cognitive process about future. Future scenario simulation also help to explain the perception of future can be more positive, and better use EFT in predcting.

### 2.3 The Effect of EFT

#### *EFT and the effect in GAD treatment*

Future thinking is typically assessed by asking participants to imagine events that could reasonably occur in the future. Participants are usually required to be specific, meaning that the duration of the activity should not exceed one day. With the exception of the GAD participants who simulated positive events, both groups found it easier to engage in episodic future thinking after repeating the simulations. They were also more likely than controls to perceive the likelihood of a negative event. Instead of facing painful social situations, patients can be encouraged to imagine other scenarios. This can control the patient's anxiety and fear to a certain extent. Positive EFT or some scenario simulation can help anxiety patients have more positive future thinking. (Moustafa et al., 2018).

Wu. et al.(2015) suggested that compared to controls, GAD patients had a higher perception of the likelihood of negative (non-positive or neutral) future events. These results indicate that GAD individuals have a negative bias in episodic future cognition and suggest that they are relatively deficient in generating vivid EFT. It is an important cognitive process in all populations, and like anxiety, EFT may also be part of the future-oriented cognitive environment in GAD. A more complete understanding of future-oriented thinking in GAD requires an examination of EFT in this population. They also predicted that GAD patients would selectively rate negative events over neutral or positive ones because they were more credible than controls, based on previous findings that anxious people have a more pessimistic view of the future. Compared with individuals without GAD, the GAD group showed less increase in detail after repeated simulations. Notably, non-anxious participants spontaneously added details to the simulation even when they were instructed not to, similar to results previously found in healthy samples.

EFT activity in patients with generalized anxiety in the description of the research results show that although they can often participate in EFT with similar level of the normal individuals, anxiety individuals are less likely to spontaneously detailed scene simulation, and they may not find positive EFT less easily. This is the benefit that healthy individuals get from repeated simulations.

The above findings suggest that when simulating the future, GAD patients may not be able to engage in vivid EFT and relative lack of cognitive flexibility in repeated cognitive events, especially if the hypothetical event is positive. Together with a seemingly more credible assessment of future occurrences of negative episodes, may contribute to the clinical profile of GAD.

Using an experimental recombination process, the research demonstrates that GAD patients are less likely to spontaneously add details when repeatedly simulating future events than non-anxiety patients, and cannot find positive events that easy to simulate as non-anxiety patients do. They also assessed the likelihood of negative events more selectively than healthy people, without any compounding factors from past worries (Wu et al., 2015).

## 2.4 The Influencing Mechanism between EFT and the Treatment of Anxiety

### *Episodic future thinking help retrieve positive memories*

EFT reduces anxiety by helping individuals recall positive past memories and use them to process future events.

There are two models to explain the function. The first model is memory reconstruction model, that is, emotion-driven learning and retrieval in scenario foresight. The second model is the valuation model. The excessive tradeoff of risk and uncertainty can be used to explain "future-oriented thinking". Two models suggest that people's predictions about the future may affect their anxiety levels as they retrieve memories. It was expected that the high anxiety group would have a stronger reduction in emotional intensity in the positive future simulation than the negative future simulation, while we expected that the low anxiety group would have a stronger reduction in emotional intensity in the negative future simulation than the positive future simulation (Beyon et al., 2014).

Montijn et al.(2021)suggested that in individuals with low trait anxiety, emotion improves cued recall of imagined future events, a finding that fits well with previous research on enhanced emotional memory. The findings suggest that people with high levels of anxiety may lack this method of enhancing emotional memory. In fact, earlier studies using the perception-weirdness task have shown similar effects on trait anxiety: individuals with high trait anxiety do not benefit from the weirdness of someone's mood, whereas low-anxiety controls do..

Mathews and Mackintosh(2000) discovered that Cmb-I training can help people make more positive future thinking during situational events. Web-based Cognitive Bias Modification (CBM-I) uses image-centered scenarios to reduce cognitive bias in patients with depression. Based on the cognitive bias modification theory, CBM-I aims to reduce negative cognitive bias and improve depressive symptoms. A widely used CBM-I paradigm is the Fuzzy Situation task, in which participants repeatedly practice solving verbal situations describing fuzzy everyday situations in a benign or positive manner.

The use of retrieval memory loss in memory retrieve can also be a factor that enhance the use of EFT in retrieving memories. It can help people better develop episodic thinking and also try to think in a positive way, which is important for reducing anxiety.

Marsh. et al(2019) pointed out that positive tendencies in autobiographical memory and episodic future thinking are thought to be important for mental health and reduce anxiety and depression. Retrieval mermory loss (RIF) is thought to be one of the causes of these deviations. RIF and decreased anxiety.Healthy people were better able to retrieve positive memories than those with anxiety. This free recall and future scenario simulation more closely mirrors natural everyday memory retrieval and future simulation, indicating whether these findings are relevant outside the laboratory. Memory valence score, number of future episodes, RIF, facilitation, rumination, anxiety and depression scores were used as predictors of mean future episode valence.

### *Anxiety and rumination.*

EFT can also help with the decrease in rumination, and therefore reduce the pressure for people.

Importantly, individual RIF levels were found to be significantly associated with the potency of memory, suggesting that RIF may contribute to this positive tendency. Storm and Jobe(2012) found a relationship between RIF and the average self-rated value of memories freely retrieved for a set of neutral cue words, rather than a value determined by the total number of retrievable memories in explicitly stated positive or negative retrieval categories. The current findings showing that depressed patients with higher RIF levels have more negative memories would support this theory (Marsh et al., 2019).

### *The worry about future*

The worry about furture can be reduced by using positive EFT, and help people lower the anxiety level.

In the clinical literature, worry is defined as primarily abstract verbal expressions of future threats. It is conceptualized to rely primarily on semantic rather than episodic processes. Although threats can

and often do be represented by semantic and situational processes, they may contribute to threat detection and management in different ways.

Byrne. et al(2002) proposed that episodic recall of previously encountered threats allows individuals to revisit the past, learn from the consequences of their actions, and consider different histories that might have emerged had they acted differently. Anxious individuals consistently show a bias against threat-related information when retrieving episodic memories. Counterfactual simulations may play a key role in learning from past encounters and episodic memories, as they allow one to identify alternative courses of action that may better deal with "perceived stressors".

Bulley. et al (2017) also said that a large number of studies have shown that the emotional state of anxiety will induce people to retrieve threat-related information from memory in a biased way, leading to people's tendency to construct threat-related psychological scenes.

## 2.5 The Limitation in EFT

### *Aging and the reduction in future simulation*

The impairment of depression is also closely related to the specificity of future thinking, such as the level of situational detail in "future simulations" (King et al., 2011), the appearance of future imagery, and the specification of personal goals.

It has been suggested that age may moderate the relationship between depression and excessive memory, for it is associated with previous episodes of depression and hippocampal damage. Episodic memory and simulation rely on similar neurocognitive processes, suggesting that future thinking and memory patterns are similar in people with depression. Therefore, the deficit is not particularly pronounced for all affective valence, but it is most obvious in positive future thinking. Future studies comparing the specificity of future thinking in people with depression compared to those with current depression, and help address whether this generality is better explained by characteristics or state factors, such as negative emotions.

The participants thinking about the future was not a significant moderating factor. Still, the analysis did not reveal evidence of specific reductions in depression only consider the effect size of studies that used more supportive "event" cues. Therefore, specificity is greatly influenced when trying to imagine positive future events, and not been affected at all when imagining negative events (Gamble et al., 2019).

## 2.6 Other Perspectives

The use of EFT in the treatment of GAD has not been proven so far, and it has been argued that because scenario simulations of costly future threat events are often emotionally charged, they play an important motivational role in avoiding or reducing potential dangers. Indeed, recent evidence suggests that the ability to suppress anticipatory simulations of scary events may be important in modulating anxiety about the future (Benoit et al., 2016).

A species capable of abstract and narrative mental representations of past and future threats has a powerful advantage in managing potential dangers in the future. Inwardly generated thinking about threats, not limited to hints from external circumstances, opens a larger window of time between the present moment and future danger, providing valuable time for avoidance or preparation.

CBM treatment studies are not always effective, especially in reducing anxiety symptoms, and participation is problematic as participants report that the intervention is boring.

## 3. Conclusion

According to the research paper above, most of them support my idea of EFT and the reduce in anxiety. Some prove the relationship between the two factors, like the retrieve of positive memories, the treatment of GAD, and also the simulation about future can help explain the relationship. Moreover, there are also articles about strengthening positive EFT to improve the ability. For example, the increase in the positive bias, the increase in episodically simulating future, and the aging process

all contribute to the development of positive EFT, and lead to the decrease in anxiety level. Though, there are still some articles argues that the research is not enough to get the conclusion of EFT help reduce pressure. Therefore, for the future research, we should focus on conducting more experiments, and also research about the congruent variable in the relationship of EFT and reduce in anxiety.

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