



Isipa

Instituto Universitário
de Ciências Psicológicas,
Sociais e da Vida

**From Emotional Regulation to Mental Health: Fading
Affect Bias and Depression – a Systematic Review**

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Dissertação submetida como requisito parcial para a obtenção do grau de:

Mestre em Psicologia Clínica

2023

Dissertação de Mestrado realizada sob a orientação da
Professora Doutra Raquel Lemos, apresentada no Ispa
– Instituto Universitário para obtenção de grau de
Mestre na especialidade de Psicologia Clínica

Agradecimentos

À professora doutora Raquel Lemos, pelo acompanhamento, disponibilidade e principalmente paciência. Pela confiança depositada e novamente pela paciência.

À Mafalda, pela disponibilidade, comprometimento pelo projeto, esforço, competência e por ser no seu geral uma pessoa bastante porreira, a quem desejo toda a sorte no futuro.

À professora doutora Inês Almeida pelo acompanhamento, disponibilidade e conhecimentos prestados.

Aos meus pais que se fartaram de pagar propinas e mesmo assim nunca pediram nada para além da minha felicidade. São uns bons velhos. É possível que não percebam nada do que está escrito neste trabalho, mas hei de ter tempo para explicar.

Aos amigos que às vezes ouvem, outras vezes falam e por vezes até bebem uma cerveja ou outra, que continuem presentes.

“Anything not saved will be lost.”

Ecrã de saída da Nintendo

Resumo

Sabe-se que a depressão afeta o funcionamento cognitivo bem como os vieses de memória que promovem uma boa saúde mental. O *Fading Affect Bias* (FAB) é um viés de memória autobiográfica em que a intensidade da emoção associada aos eventos se desvanece com o tempo, sendo mais rápida para os acontecimentos negativos. Estudos anteriores sugerem que a depressão afeta o efeito do FAB, fazendo com que os eventos negativos desvaneçam mais lentamente, e acelerando esse processo para os eventos positivos. À medida que a investigação sobre o FAB continua a crescer, afigura-se importante a agregação da informação existente de forma a melhor informar o que se encontra por responder e a solidificar o que já se sabe. Assim, o presente trabalho pretende, através de uma revisão sistemática, consolidar a informação da literatura sobre a associação entre o FAB e a depressão. No presente estudo, é explorada a associação entre o FAB e a depressão. São discutidas futuras implicações de investigação e prática.

Palavras-Chave: Fading Affect Bias, Depressão, Regulação Emocional, Memória Autobiográfica

Número de páginas: 34

Abstract

Depression is known to affect cognitive processing and memory biases that promote good mental health. The Fading Affect Bias (FAB) is an autobiographical memory bias where the emotional intensity associated with events fades over time, with faster fading for the negative events. Depression is known to alter the FAB effect, making negative events fade slower and positive events faster. As FAB research continues to grow, it is important to aggregate information to understand what is known and what is still unanswered. Therefore, a systematic review is warranted to help consolidate the literature on the association between FAB and depression, as well as compile the findings of previous work. In the present study, the association between FAB and depression is explored. Future research and clinical implications are discussed.

Keywords: Fading Affect Bias, Depression, Emotional Regulation, Autobiographical Memory

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Introduction

Imagine the following situation: Two individuals go to the same job interview; both fail to get the job. One remains remarkably composed and confident that other opportunities will eventually arise. This individual then takes proactive measures to prepare for a potential interview. The other individual reacts negatively and interprets this rejection as if the world is plotting against him, further confirming and deepening his already negative views of himself. Over time, the first individual managed another couple of interviews and landed a job, while the other remained jobless and without trying because he could not process this event and still holds highly charged negative emotions when recalling the interview. The former exemplifies how the Fading Affect Bias (FAB) functions in a healthy individual and one with depression.

The FAB is a memory bias that shows that the affect associated with negative memories fades faster than the affect associated with positive memories (Walker & Skowronski, 2009). The first instances of interest in FAB-related phenomena trace back to the 1930s, when Meltzer (1930) conducted an experiment hoping to understand how individuals forgot different memories based on the valence they attributed to them. The study found that positively coded memories were recalled at higher rates when prompted in comparison to negative ones (Meltzer, 1930). The previously mentioned study was later replicated by Meltzer (1931) and Jersild (1931). Those studies proposed that individuals found ways to cope with negative events, consequently making them less readily available when prompted to recall. However, only a year later came the first empirical evidence of the FAB, when Cason (1932) tested the emotion of individuals when prompted to recall both positive and negative autobiographical memories instead of the previously studied ability to recall these memories. When comparing how the emotional intensity changed over time (from the initial onset to the time of recall), the results indicated that the emotion for positive memories was maintained to a greater extent in comparison to negative ones (Cason, 1932). In essence, the FAB represents the bias towards keeping the positive affect related to positive autobiographical memories - i.e., an event that, at the time of its occurrence, was coded as positive holds its valence and intensity across time in a more long-lasting way than a negative event, that tends to lose

emotional intensity more rapidly and sometimes even changing in valence (i.e., affect when recalled being neutral, or positive) over time.

Although research linking affect and memory has carried over the years, it was only when Walker et al. (1997) conducted a longitudinal study that the concept of FAB resurged. In their experiment, the researchers had three groups of participants keep a diary during three different time intervals (three months, nine months, and two years). During the predefined time intervals, participants were asked to report and classify life events according to their emotional valence and intensity. Afterward, and following three other time intervals (three and half months, one year, and four and a half years), participants were called back to the experiment, where originally reported events were read back to them. After controlling for the uniqueness of the event, the study subjects were asked to: 1) rate how well they remembered the event and 2) how they currently felt about the event. Although the four-and-a-half-year time interval showed a larger FAB effect across all time intervals, it was possible to see that: i) there was a loss of affect/emotion intensity in both pleasant and unpleasant events, meaning there was fading of affect over time, ii) the fading affect was larger for unpleasant events, in all time intervals, when compared to pleasant ones, showing the FAB. Subsequently, the same result was replicated by various authors, solidifying the FAB as a robust concept (e.g., Ritchie et al., 2009; Ritchie et al., 2014; Sedikides & Alicke, 2012). Later, in an attempt to conceptualize the function of the FAB, Walker & Skowronski (2009) hypothesized the FAB as a representation of motivational, cognitive, and social processes that aim to maintain an adaptive psychological functioning and the individual's ability to deal with stressors and negative emotion. The FAB as a representation of successful emotional regulation strategies is supported by three underlying cognitive theories allied with social processes: 1) Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2001), which suggests that positive emotions promote positive behavior; 2) Coping Mechanisms, including positive or negative strategies to deal with stressors, that strive to maintain positive and attenuate negative emotion (Sheppes et al., 2011); 3) Mobilization-Minimization hypothesis (Taylor, 1991), in which given specific emotional stimuli an individual mobilizes physiological, cognitive and behavioral mechanisms to deal with different emotionally charged events; 4) Social Processes, such as social support, positive feedback as well as social norms and self-presentation (Cohen & Wills, 1985; Skowronski & Walker, 2004).

Major depressive disorder (MDD) is one of the most prevalent mental disorders globally. A recent report by the World Health Organization (2022) ranks depression as the second highest contributor to mental health disorders, with an estimated 280 million cases worldwide, amounting to a 3.8% prevalence across all age groups, according to 2019 data. More recently, Moreno-Agostino et al. (2021) conducted a meta-analysis to evaluate the change in global prevalence rates of depression over time, finding an increased prevalence. The study suggests that one potential event that may have led to this increased prevalence is the economic crisis that started in 2008, adding more financial and housing insecurity in populations and further aggravating economic pressure and inequality over the global population. It would also be feasible to suggest that the recent Coronavirus global pandemic has played a role in an increased prevalence of depression in populations worldwide. Recent studies concerning depression prevalence ratings during the Coronavirus global pandemic have shown an alarming increase in prevalence across populations (Balakrishnan et al., 2022; Dettmann et al., 2022; Hajek et al. 2022; Kavvadas et al. 2022; Peng et al., 2022; Yuan, et al., 2022). Indeed, the World Health Organization (2022), in its World Mental Health report, indicates an increase of 28% in just one year (2020 to 2021), with a big part of that change in prevalence coming from younger age groups in which depression was previously less prevailing in comparison to older age groups. These numbers suggest a higher demand for psychological and psychiatric health care, which is still not accessible for a plethora of low to mid-income families globally. In the case of Portugal, approximately a quarter of the population suffers from a mental health condition, with depression representing a prevalence of 7.9% across the population (Ordem dos Psicólogos, 2020). However, due to the economic burden of mental health care and the lack of publicly available services, a lot of Portuguese people are still not given adequate care (Ordem dos Psicólogos, 2020). Although much has been done to attenuate the stigma regarding mental health care, as well as efforts put into creating further accessible ways to offer mental health services to the populations with the use of digital and online services (Lattie et al., 2022), there is still an urging necessity to ensure the access to proper mental health care globally and possibly an even larger need to better acquaint populations and prevent the escalating prevalence of this disease (Coombs, et al. 2021; NCCMH, 2011; Ordem dos Psicólogos, 2020), especially considering that better access to mental health care has been associated with better outcomes in population mental health (Skinner, et al. 2022). Incentivizing further research on the underlying

mechanisms of depression is not only a way to treat depression but also a strategy to prevent it in the first place.

Past research has associated depression with several changes to memory, affecting episodic, working, and autobiographical subtypes. Regarding memory as the process that informs one's life concerning the influence of past experiences, such as an individual's infancy, traumatic events, and overall decisions throughout life on present-day decision-making, depression's impact on these processes may preserve an individual depressive mood, episode, or disorder. Therefore, actively focused therapy on these cognitive biases can lead to changes in memory and stress reactivity, acting as a way to better care for patients with depression (Joorman et al., 2015). Past research has shown that depressed individuals show *Overgeneral Memory Bias*, which can predict future depression in currently remitted patients (Gibbs & Rude, 2004; Sumner et al., 2010). Besides that, individuals with depression remember negative stimuli easier than healthy patients, resulting in prolonged changes to their long-term memory (Breslow et al., 1981). Also, according to Levin et al. (2007), depression has an impact on explicit memory functions - the ability to consciously retrieve past information or experiences - by making it easier to recall negative memories, which, per Beck's (1979) cognitive triad, might act as an agent to maintain and promote depression. Alongside these known effects on memory, depression has also been heavily linked with the FAB in past literature (Bond et al., 2022; Gibbons et al., 2017; Gibbons & Bouldin, 2019; Gibbons & Lee, 2019; Hitchcock et al., 2020; Kim & Yoon, 2020; Marsh et al., 2019; Pillersdorf & Scoboria, 2019; Walker et al., 2003a). Although the FAB has been only formally conceptualized since the Walker et al. (1997) study, its association with depressive symptoms, first hypothesized by Walker et al. (2003a), has been replicated across different studies (e.g., Bond et al., 2022; Gibbons & Bouldin, 2019; Hitchcock et al., 2020; Kim & Yoon, 2020; Marsh et al., 2019; Pillersdorf & Scoboria, 2019). In Walker et al. (2003a), participants were asked to recall six emotional events from their past six months and rate the pleasantness or unpleasantness of each one. Subjects also completed the Beck Depression Inventory (BDI; Beck & Steer, 1987). Researchers then found that the healthy group showed a robust FAB effect in contrast to the group that showed depressive symptoms (in the study, groups were separated by dysphoric and non-dysphoric). In those with depressive symptoms, negative emotion faded slower, which for the first time showed a potential association between depressive symptoms and the FAB. In a second experiment

on the same study, the researchers, using a larger sample size (n=337), were not only able to replicate the results from the first experience but also found that a score of 10 on the BDI appeared to be the cut-off point from where the FAB began to be affected (Walker et al., 2003a). The study also found that participants with higher BDI scores showed slower negative and faster positive affect fade in contrast to their non-dysphoric counterparts (Walker et al., 2003a).

Although recent and extensive efforts have been made towards the study of the association between FAB and depressive symptoms, research in this domain is still limited. Some studies have used depression as a confounding variable, assuming its effect as a predictor of decreased FAB, and, on that account, something to take into consideration when studying other possible moderators and predictors (e.g., Gibbons et al., 2018; Pillersdorf & Scoboria, 2019). Although comprehensive literature has shown the association and the plausible effect of depression and depressive symptoms on the FAB, there is a lack of systematic reviews on this topic. Consequently, it is essential to conduct such a study to establish the association between the two concepts and fill this gap in the literature. Along with the need to demonstrate the link between the two variables, it is also paramount to better understand each intricacy between them and to better comprehend possible underlying mechanisms of depression in memory. The FAB represents motivational, cognitive, and social processes that aim to maintain adaptive psychological functioning and an individual's ability to deal with stressors and negative emotions. Therefore, a better understanding of this connection can help us further personalize and directly care for patients who suffer from depression. By ways of developing their coping mechanisms, by reverting the depression effect on FAB and therefore grant them the proficiency to better deal with negative stimuli and potentially improve on their affective state. The present study aims to systematically review the literature to understand and evaluate the evidence of the association between FAB and depression.

This work aims to contribute to the FAB literature by answering the following question: What is the association between FAB and depression? We believe that understanding this association will further provide new clinical and research implications.

Depression

MDD, according to the DSM-5 (American Psychiatric Association, 2013), is defined as the presence of at least five of nine symptoms, in which at least one of either depressed mood or loss of interest/pleasure must occur over at least two weeks. Also, the present symptoms must represent a change in the usual functioning of the individual, constituting clinically significant distress and/or impairment to occupational, social, or any other crucial areas of the individual's functioning. To rule out any other potential mental disorder with depressive symptoms as a comorbidity the present symptoms must not result from substance abuse or other medical conditions; therefore, doctors should also be able to discard other possible mental health conditions that carry depressive symptomatology. The symptoms are:

- 1) Depressed mood for most of the day, almost every day. This could be indicated by subjective reports (e.g.: feels no hope; feels empty) or direct observation.
- 2) Loss of pleasure or lack of interest, almost all, or all, activities most days, again indicated either subjectively or observed.
- 3) Significant weight gain or significant weight loss (more than 5% of body weight in a month), significant changes in appetite almost every day (either more appetite or less).
- 4) Psychomotor agitation or retardation almost every day that is observable by others and not only subjectively reported, such as feelings of slowing down or inability to rest.
- 5) Insomnia or hypersomnia almost every day.
- 6) Loss of energy or fatigue almost every day.
- 7) Feelings of inappropriate guilt or worthlessness almost every day.
- 8) Loss of ability to concentrate or think, or feelings of indecisiveness almost every day.
- 9) Thoughts of death that happen recurrently, suicidal ideation without a specific plan, or attempted suicide or specific planning for committing suicide.

Depression affects roughly 5% of people worldwide (WHO, 2022) and constitutes a risk factor for suicide. Suicide represents more than 700,000 deaths yearly

and is the fourth leading cause of mortality between the ages of 15 and 29. Almost 80% of suicides occur in low- and mid-income countries, which also constitute people with less capacity to undergo mental health care (WHO, 2021). It is important to note that for every thousand suicide attempts that lead to death, there are thousands more failed attempts, reinforcing the need to create policies and develop resources to make mental health care more accessible.

For the present work, although some articles used for the review differentiated people with MDD from healthy controls, a broader definition will be used, focusing not only on clinically diagnosed MDD but mainly on the presence of depressive symptoms. Depressive symptoms may be accounted for with different questionnaires or interviews. There are no restrictions on the type of instruments, provided they are based on scientific evidence.

With all this in mind, the present study will focus on how depressive symptoms impact the FAB. As the measures used by the reviewed articles may differ between studies, some considering the ascending severity of depressive symptoms, and some a dichotomic healthy vs. depressive design, this study will take into account the overall presence of depressive symptoms and how it may change the FAB.

Autobiographical memory and depression

Memory biases are associated with good mental health; specifically, autobiographical memory biases can work in favor of maintaining good mental health (Hitchcock et al., 2017). The FAB is one of the autobiographical memory biases working in favor of good mental health, with negative affect fading faster over time than positive (Walker & Skowronski, 2009). Self-enhancement bias increases self-esteem by distorting events to make them better reflect the idea of self and usually characterize psychologically healthy individuals. For depressed individuals, this bias carries a negative connotation, making it easier to retrieve negative memories following positive trait evaluations (Hitchcock et al., 2017). This counterintuitive mechanism may help retain a depressive mood.

These memory biases created or altered when an individual is in a depressive state work both ways: 1) Depression inverts the pre-existing bias for positivity; 2) The current negative bias helps maintain depression. One example of a bidirectional interaction between memory bias and depression is the *overgeneral autobiographic*

memory bias present in depressed individuals (Gibbs & Rude, 2004). This bias works by making these individuals refer to categoric (i.e., events that occur repeatedly) or extended (i.e., events that last more than a day – e.g., a period in one’s life) memories even when prompted to provide specific (i.e., something that happened in a set time and day, unique in its nature – e.g., enrolling in college; the birth of a son) memories. This bias has been shown not only to be associated with poor progress in a treatment setting but also as a vulnerability to future depressive episodes, even in otherwise healthy individuals (Gibbs & Rude, 2004). We can link this bias to the FAB as events that are considered typical tend to maintain negative affect for longer periods (discussed below).

Besides the aforementioned bias, Werner-Seidler and Moulds (2011) postulate that there might be a deficit in processing positive information in depression. Remitted depression individuals showed less ability to vividly detail positive memories when induced with a sad mood compared to individuals with no history of depression. Depressed individuals also find that negative memories are more readily available at recall compared to positive ones (Williams & Scott, 1988). This easier availability of negative content, alongside a lot of underlying mechanisms associated with depression and memory biases, as well as the impaired FAB, all work in the maintenance of the depressive state.

Fading Affect Bias

Definition

In the present work, Walker and Skowronski's (2009) definition will be considered. The authors define the FAB as “the relative preservation of positive emotions over negative emotions in autobiographical memory” (Walker & Skowronski, 2009, p. 1125). This definition blooms from the fact that autobiographical recall generates an emotional response. The intensity of the emotional response prompted by this recall tends to fade over time. However, the fading is faster for negative autobiographical memories than positive ones, configuring the FAB (Walker et al., 2003b).

Empirical evidence

Walker et al. (1997) conducted a study with three experiments. In experiment 1, 43 participants registered one daily event for three months on a diary, rating each event on its valence and intensity on a 7-point Likert scale ranging from -3 (extremely

unpleasant) to +3 (extremely pleasant), with a neutral point at 0. These events had to be unique, meaning they should not be reoccurring during the registering phase. The events had to be described in three lines or less, and they could not be considered embarrassing for the participant (this was done to avoid any bias or discomfort after participants were read back their memories). After three months of registering, the researchers read the events to the participants in a random order. After confirming the uniqueness of the event, the participants gave extended information about it. Only the items concerning memory (i.e., How well do you remember the event?) and pleasantness were considered. Following this, the researchers found that the affect for both negative and positive events faded with time, but fading was higher for the unpleasant events. In Experiment 2 (n = 6), the researchers extended the retention interval to a maximum of one year (i.e., participants kept a diary for nine months and, three months later, were called again for the testing phase, therefore allowing for a retention interval of up to one year), replicating experiment 1 but extending the timespan of the events recalled. The results found were similar to what was reported in the first experiment. Finally, Experiment 3 (n = 1) was serendipitous, as a single participant belonged to Experiment 2 but, due to a misunderstanding, was not tested with the other subjects. This participant was called back four and a half years following the beginning of experiment 2. Interestingly, the results were the same as the previous experiments. Data from this study has shown that emotionally intense memories were recalled more easily, suggesting that memory is driven by emotion (Walker et al., 1997). Pleasant events were also better remembered than negative ones which, according to the authors, came in accordance with the literature at that time.

Following the aforementioned study, Ritchie et al. (2009) aimed at replicating the results using a single session retrieving phase, by asking participants to generate both pleasant and unpleasant events. Participants also provided affect ratings for the time when events happened (i.e., at event occurrence) and for the present time, (i.e., at event's recall). Again, the FAB occurred with a mean affect change, (i.e., the difference between the affect then and the affect now), for negative events ($M = 1.01$) appearing twice as large as the mean affect change for positive events ($M = 0.48$). Older events ($M = 0.87$) showed a bigger change in affect when compared to recent events ($M = 0.53$). However, this difference did not reach levels of statistical significance in the interaction effect between event age and event affect.

Walker and Skowronski (2009) reviewed the reported FAB on the robustness of its effect across different methods and samples, by listing seven different studies with different cultural populations and methodologies, mainly ranging from the diary method to the single session recall. This review showed that the FAB effect was replicated across all studies and potential moderators of the FAB were discussed.

FAB moderators

With the FAB established, the search for potential moderators became important. In the first FAB studies the event time was understood as affecting FAB, with older events providing a larger mean affect change compared to more recent events (Ritchie et al., 2009; Walker et al., 1997). This change is explained by passive and active mechanisms. The passing of time contributes to the dampening of emotional memory content in favor of the here and now (excluding traumatic past events that can linger for longer than everyday occurrences or lower-intensity emotional memories). Social mechanisms may also help to preserve or reinterpret memories.

Characteristics of the event

Ritchie et al. (2006) conducted a study to find moderators of the FAB. In their manuscript, the researchers tackled the notion that the emotional intensity of the event was responsible for the FAB effect, meaning that the overestimation of unpleasant events, compared to positive ones, would lead to the FAB effect. However, initial event valence was not significant in the outcome of the FAB. Therefore, the FAB was not a result of initial valence intensity but rather the difference in affect from the original onset to the retrieval moment. Yet, what did contribute to the size of the FAB effect were the characteristics of the event.

Event self-importance

Events rated as more important to one's vision of self tend to fade less than the ones with low importance. Despite that, the effect of self-importance on the FAB is more pronounced in negative events, meaning that unpleasant memories that hold high self-importance also show less fade in affect when recalled (Ritchie et al., 2006). This can be especially seen in people with Post-Traumatic Stress Disorder. As for the effect of self-importance on the FAB, a memory that aligns with one's self-image is more likely to be reproduced, therefore maintaining the affect over time, (e.g., someone that holds high value in being an academic may recall memories related to positive academic events more

often, to other or themselves, therefore maintaining the positive affect of that memory), in contrary to an event that is contradictive of one's view of self (Ritchie et al., 2006).

Event self-typicality

How typical an event is has effects on the FAB. However, these effects work divergently in both positive and negative memories. For positive memories, events that are not typical occurrences keep more affect over time. For negative memories, the opposite happened: unpleasant typical events were more likely to evoke negative emotion when recalled, consequently maintaining the affect (Ritchie et al., 2006). This phenomenon becomes particularly intriguing in the context of depression: per Beck's (1979) cognitive triad, automatic and ruminative negative thoughts are common in those with a depressive disorder. Therefore, the event typicality's effect on the FAB may be evidence of this.

Event psychological opening

Beike & Wirth-Beaumont (2005) explored the common popular idea of closure and unresolved situations. In their work, they suggest that events that people classify as open lead to better recall; also, these events carry with them an emotional intensity, and the way they are described is often emotionally charged. On the flip side, when there is closure (i.e., events that no longer hold emotional charge), an event no longer holds emotional arousal when retrieved. This idea seems to work in favor of the FAB theory, meaning that psychologically closed events would show a much larger FAB effect compared to open ones. To test this idea, Ritchie et al. (2006) asked participants to answer how psychologically closed or open was each event. Results showed that negative psychologically resolved events appear to have greater fading than psychologically opened ones. On the positive events side, psychologically closed events fade less than open ones; however, this association was not significant.

Event self-cause

This variable describes the extent to which the perception of self-causation on the event (i.e., how much control over the situation is perceived. For example, actively making dinner holds more self-causation than eating out). The effect of this variable was counterintuitive: affect faded more with larger self-causation for positive events and showed no effect on negative events (Ritchie et al., 2006).

On a final note, on event characteristics, the authors suggested that event self-importance accounts for the possible effect of event closure/openness and event self-causation variables. In turn, the authors suggest that this adds little to nothing to truly understand a possible moderating affect from causation and openness variables.

Individual differences between subjects

Anxiety

Anxiety has been linked to a dampening of the FAB effect. Gibbons & Lee (2019) conducted a study where participants (n = 1006) completed the Depression Anxiety and Stress Scale (DASS), and each of the psychological distress variables was individually accounted for. Results showed a similar effect to that of depression on the FAB. However, with depression, FAB became non-existent at higher levels, which did not happen with anxiety. Marsh et al. (2019) had participants (n = 296) complete both BDI and Beck Anxiety Inventory (BAI) before undergoing the FAB protocol. Results found that depressive symptoms, but not anxiety, were predictive of lower affect fade, after controlling for possible confounders. The study found a significant interaction between anxiety and depressive symptoms predicting affect fade; however, anxiety symptoms did not account for the association between depressive symptoms and reduced affect fade. Additionally, the study also found that depressive symptoms were related to reduced affect fade only at higher levels of anxiety. These findings indicate that the role of anxiety on the FAB might be related to the condition's highly comorbid nature with depressive symptoms but not with anxiety alone. More studies are needed to understand the role of anxiety on the FAB.

Narcissism

As per the DSM-5 definition, narcissism comprises a pattern of grandiosity, the need for admiration, and a lack of empathy (APA, 2013). According to this definition, it might appear that narcissists would not show a diminished FAB effect. However, Ritchie et al. (2014) found that individuals who scored higher on the Narcissistic Personality Inventory showed a smaller FAB effect than those who scored lower. Based on these results, the authors suggest that the FAB effect is unrelated to the views that one has of oneself but rather emotional regulation processes and the ability that one has to use them (Ritchie et al., 2014). As in depressive individuals, narcissists have difficulties in emotional regulation. Loeffler et al. (2020) found that vulnerable narcissism - and not

grandiose narcissism - was associated with psychological distress and maladaptive use of emotion regulation strategies. It also showed a positive correlation with depression, suggesting that the effect of narcissism on the FAB is due to self-regulation difficulties and not views about the self.

Future vs Past orientation

Past-oriented individuals also show a dampened FAB compared to present and future-oriented ones (Skowronski et al., 2014). Again, this can be compared to depression as individuals suffering from depression have been linked to a greater attachment to past events (Eysenck et al., 2006), which, added to the rumination behavior that typically characterizes depression (Nolen-Hoeksema, 2000), may work as an underlying mechanism to maintain depression and in consequence reduces the FAB.

Mood

It would be reasonable to point out that mood at the time of recall could impact the results for the FAB. Lewis & Critchley (2003) talk about mood-dependent memory, suggesting one's current mood might alter cognitive mechanisms like attention (e.g., negative things might seem to happen more) and memory (people would recall past autobiographical memories more negatively). To test the hypothesis that mood could moderate the FAB, Ritchie et al. (2009) had participants (n = 156) respond to the Positive and Negative Affect Schedule (PANAS) to assess their current mood. The results showed an interaction between participants' mood and their FAB. Although the FAB was still present even in lower-mood participants, it was larger in the most positive mood scores (Ritchie et al., 2009). The authors suggest that mood might account for a change in the extent of the FAB effect but not its existence (Ritchie et al., 2009). More recently, some studies started accounting for mood when studying the FAB (e.g.: Gibbons et al., 2017; Gibbons & Bouldin, 2019)

Rehearsal

Rehearsal is the repetitive recall of information to keep it longer in memory (APA, n.d.b). Rehearsal can be private - when consciously or unconsciously recalling a memory – or socially oriented when sharing memories with others. Gibbons and Lee (2019) found that rehearsal partially mediated the association between psychological distress variables and the FAB. The mediation effect, however, did not reduce the two-way interaction between psychological distress variables and the FAB. Also, Marsh et al.

(2019) tested if thinking about negative life events (i.e., how often is the event talked about, thought about, or written about) mediated the association between depression and the FAB. Results showed that people with higher scores in the BDI thought and wrote more about their memories. Opposed to what might be assumed, writing was not significantly associated with affect fade, as was talking about memories; thus, it rules out these variables as mediators between depression and the FAB. Thinking about memories, on the contrary, was significantly associated with lowered affect fade, meaning it disrupted the FAB in people with higher scores in the BDI, but only for negative events. As reported earlier, depression and rumination are interconnected (Nolen-Hoeksema, 2000), and this seems to be the most damaging form of rehearsal to the FAB in individuals with higher levels of depressive symptomatology.

Methodological concerns and limitations

The FAB is a relatively new concept, and although there is a good body of work to understand the effect, further empirical evidence is needed.

The FAB is resilient across a multitude of different methods: Diary method (e.g., Ritchie & Skowronski, 2008; Walker et al., 1997) - where participants keep a diary and register events that occur across a pre-determined time period; Events given from a set time-rate - where participants recall and describe memories that occurred inside a given time interval (this could be the past six months, or a set of years, or a particular time frame; Ritchie et al., 2006; Walker & Skowronski, 2003a); Free recall of events - where participants are instructed to recall as many autobiographical memories as possible given a time-limit to recall autobiographical events¹ (e.g., Hitchcock et al., 2020). The number of autobiographical events recalled might also be different across studies: some may allow for an unlimited number in a limited time frame, while others might directly ask for a fixed number of events (eg.: Gibbons & Bouldin, 2019; Kim & Yoon, 2020; Marsh et al., 2019; Pillersdorf & Scoboria, 2019).

Across all the different methods, the FAB has been consistently replicated, therefore, it is not a bias of any method in retrieving autobiographical memories (Skowronski et al., 2014).

¹ In these studies memory fluency is often measured as well.

The most common ways to measure the FAB derives from the FAB Protocol, as could be seen in Walker and Skowronski's (2003a) study. The FAB protocol has participants recall a set number of emotionally intense events, both positive and negative, from a defined timeframe (e.g., four positive and four negative events from the past six months). Participants then evaluate the pleasantness/unpleasantness of the event at the time of occurrence and at recall (i.e., how they feel at the time they recall the event).

It is important to mention that the FAB Protocol is not a fixed set of instructions, allowing for the variation of its components across different studies. This might eventually lead to a bias, therefore suggesting that a universal method is needed to ensure the quality and homogeneity of data regarding the FAB.

Another potential limitation of the FAB is the fact that most of the work has been done by the "FAB Collective" - a group of investigators that has extensively studied the bias. A great limitation is the fact that the same group employs the same methods to determine the FAB, therefore representing a snowball effect of potentially false assumptions. The FAB, however, has been studied outside of the collective and has been robustly replicated, not only across methods but also in varied cultures and populations (e.g., Bond et al., 2022; Hitchcock et al., 2020; Schrauf & Hoffman, 2007).

Finally, another possible limitation comes with the retrospective or recall bias. This bias is not limited to the FAB but is a potential limitation that arises in all retrospective studies. This bias is highly dependent on interpersonal characteristics as well as methodological concerns involving questionnaire designs, study protocols, or even the motivation of the participants as well as their ideas and ways of viewing life (Coughlin, 1990). Skowronski et al. (2014) suggest that the diary method might attenuate this retrospective bias. The authors suggest possible ways to minimize this bias such as using memory cueing techniques, electronic diaries, or using objective records (e.g., test scores or news for memories).

Function

Skowronski et al. (2019) provided a theoretical context for the FAB where the authors refer to four different processes that explain the FAB effect and function.

Broaden-and-Build Theory of Positive Emotions

This theory postulates that positive emotion promotes behavior related to exploration, play, and creativity. In essence, this means that positive emotions by themselves do not offer survival value. Therefore, motivated by positive emotions, people tend to build upon those by adopting positive seeking behaviors (e.g., a child has a positive experience solving a math problem at school, realizes they like math, and adopts behaviors that replicate the emotions felt, leading to problem seeking and problem-solving, that in turn result in upgraded cognitive skills). In summary, positive emotions broaden the exploration of new ideas, actions, and social bonds, building psychological, intellectual, and social resources (Fredrickson, 2001). This theory also suggests that positive emotions may mediate an individual's ability to efficiently regulate emotion to better deal with negative emotion (Tugade & Fredrickson, 2004). Following this theory, the FAB may hold the function of helping individuals maintain their positivity to promote adaptive behavior.

Mobilization-Minimization hypothesis

According to this hypothesis, emotionally charged events generate responses in people's cognitive, behavioral, and physiological systems. These responses are called mobilization, and it is used to minimize the impact of the event. However, mobilization happens to be asymmetrical, meaning that it is stronger for negative events (Taylor, 1991). In practice, if someone were to be fired from a job, this event would promote an emotional reaction and, if the person liked the job, this would be a negative reaction. Therefore, according to this hypothesis, there would be a mobilization process of the person, with physiological, cognitive, and behavioral responses minimizing the impact of this event. This response could be in the form of new strategies development, physical rest, or any other emotional regulation strategy that would lead to the dampening of the negative emotion. On the other hand, imagining that the same person was promoted instead of fired, the mobilization process would be smaller, making the minimization of this emotional event reduced or non-existent. In the FAB context, this hypothesis helps to understand the FAB function of dampening negative emotions over time while maintaining positive emotions in healthy individuals.

Coping Mechanisms

The APA defines coping as the use of cognitive and behavioral strategies to manage a situation that exceeds the perceived resources of oneself or to reduce negative emotions or conflict caused by stress (APA, n.d.a). Coping strategies work to maintain an individual's well-being, both mentally and emotionally (Lazarus & Folkman, 1984). These strategies develop in accordance with one's life experiences. However, importantly, they can be trained and taught, which could play a big role in people with a disrupted FAB (more on this topic on future practice implications below). The process of coping happens in emotional regulation attempts and may begin to alter the response instantly (e.g., something as common as crying or laughing after an emotional event works as a coping mechanism, either to promote the emotion elicited by the event or to attenuate negative emotion). In the context of the FAB, we can easily understand how coping mechanisms may help in the fading effect of negative memories as well as promote positive emotions.

Social Processes

Finally, together with the three previously mentioned cognitive processes, social factors may also play a role in the FAB. Social Support, for example, may assume many forms, such as: emotional (e.g., a friend that offers positive reassurance); informational, in the form of advice; tangible, in the form of donated goods; instrumental (e.g., a friend helps you perform a task) (Cohen & Wills, 1985). These social support mechanisms can play a role in our ability to reframe and minimize negative emotions. Besides social support, social norms also play a role in the FAB, specifically for positive emotions. These norms can promote the maintenance of positive memories that work in favor of one's self-concept and self-esteem as well as dampen negative memories that work contrary to these ideas (Skowronski & Walker, 2004).

Based on this theoretical framework, the FAB acts as an agglomerate of emotional regulation strategies, and the FAB's output, in essence, is the reflection of adaptive emotional regulation strategies.

Noteworthy, depression does not directly disrupt the FAB for itself but rather disrupts the emotional regulation strategies that promote the FAB. In conclusion, depression acts as a moderator of the association between initial event valence (positive

or negative) and the FAB, and this association is a result of emotional regulation strategies (see Figure 1 for visual representation).

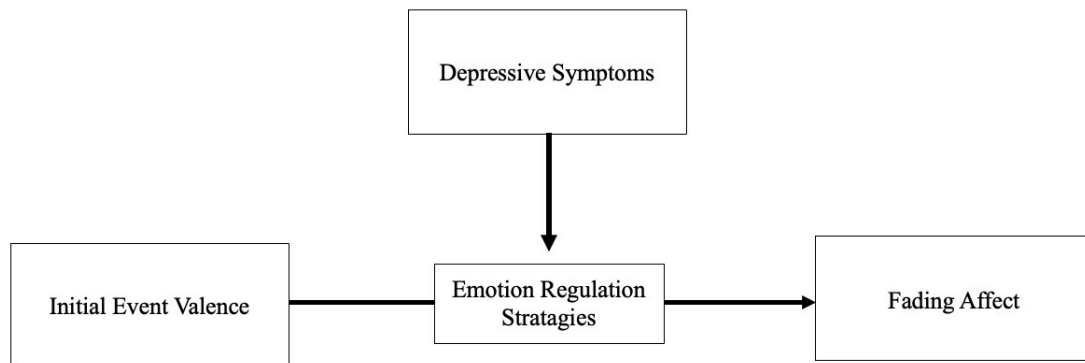


Figure 1 – Visual representation of depression and FAB association

Summary and Research questions

The present study, aims to review the existing literature on the FAB and Depression in order to address key questions:

- What is the association between the FAB and Depression?
- What future research paths can researchers follow?
- How can the FAB inform new ways to be used in clinical practice?

Methods

Systematic review

The protocol for this systematic review was registered on the International Prospective Register of Systematic Reviews (PROSPERO CRD42023411210) in accordance with PRISMA-P guidelines (Page et al., 2021). Therefore, to ensure the review is systematic, its process was divided into four steps: Identification, Selection, Eligibility, and Inclusion.

To conduct a literature search the PICOS tool (Akers et al, 2009) was followed. This tool has 5 steps to inform the search: Population, Intervention, Comparison, Outcome, and Study type. Therefore, for the population the presence of depressive symptoms had to be accounted for, as there was no need for intervention this step was not accounted for. For comparison, studies comparing healthy vs. depressed individuals, or

studies comparing different severities of depressive symptoms were accounted for. Finally, for outcome, the FAB had to be measured and for study type, empirical research studies were considered. Four electronic bibliographic databases were used (Web of Science, Scopus, MEDLINE/PubMed, and EBSCOhost/APAPsycINFO). When applicable, a filter to restrict search results only to articles with human participants was used. The search string used was: ‘fading affect bias’ AND ‘depression’, retaining full-text screening. This was done due to the recency of the term Fading Affect Bias, by screening the full text it would be possible to find any potential article that did not address the FAB with the same name, but at the same time might have referenced an article addressing the FAB on its title. The search reported in this work was undertaken in January 2023, ending in March 2023.

Cross-sectional and longitudinal studies analyzing the FAB on participants with symptoms of depression compared to healthy participants, or any cohort study that evaluated the evolution of the FAB were included in the review. No restrictions regarding publication date, publication status, or country of origin were applied, although only articles in English were considered. Narrative, systematic, or meta-analytic reviews and guidelines were excluded; however, the reference list of reviews, meta-analyses, book chapters, and of the articles included in the final full paper consensus were manually reviewed for any additional relevant papers. Only peer-reviewed publications were included.

Publications found across the databases were included in the systematic review if they followed the inclusion criteria: 1) were written in English; 2) were original research publications (reviews or opinion articles were excluded), either published or unpublished manuscripts; 3) Involved adult participants with depression or depressive symptoms □measured using standard diagnostic tools or criteria (DSM or ICD), or validated and recognized dimensional scales measuring depression (e.g.: self-rated measures (e.g., BDI), or clinician-administered (e.g., Hamilton Depression Rating Scale)□ to establish the difference between healthy participants, or if depressive symptoms were used as a variable to interact with the FAB outcome; 4) Measured the FAB or FAB-like phenomenon. Publications were excluded if considering studies with animals, or participants <18, there was no direct measure of depression or depressive symptoms presented as a meaningful sample, there was no direct measure of the FAB or FAB-like effect.

Data concerning full-text publications was collected and entered in the automation web tool for systematic reviews - Rayyan (Ouzzani et al., 2016). The tool automatically detects duplicates, which are counted and eliminated. The titles and abstracts of the remaining articles were then screened independently by two authors considering the criteria defined above. Studies were marked either as included, excluded, or maybe, in a blind manner using Rayyan (Ouzzani et al. 2016). Following the upload of the references gathered within the databases, study selection followed a title + abstract and a full-text review of the selected studies in the title + abstract phase.

Due to the small number of studies gathered (see Figure 1 below for the flow diagram), studies marked as eligible by at least one of the authors were considered for full-text analysis. In full-text analysis, when disagreements on whether a publication should be included or not arose, reasons for inclusion were discussed between the two original reviewers with the addition of a third reviewer to act as a tiebreaker based on the inclusion criteria until a consensus was reached.

Risk of bias

To attenuate the risk of bias, for this systematic review, both significant and non-significant findings were registered. To attenuate database bias, four reference databases were used, and every article reference list was screened for articles missed by our syntax, leading to three articles further screened; these were excluded due to an absence of a FAB measure.

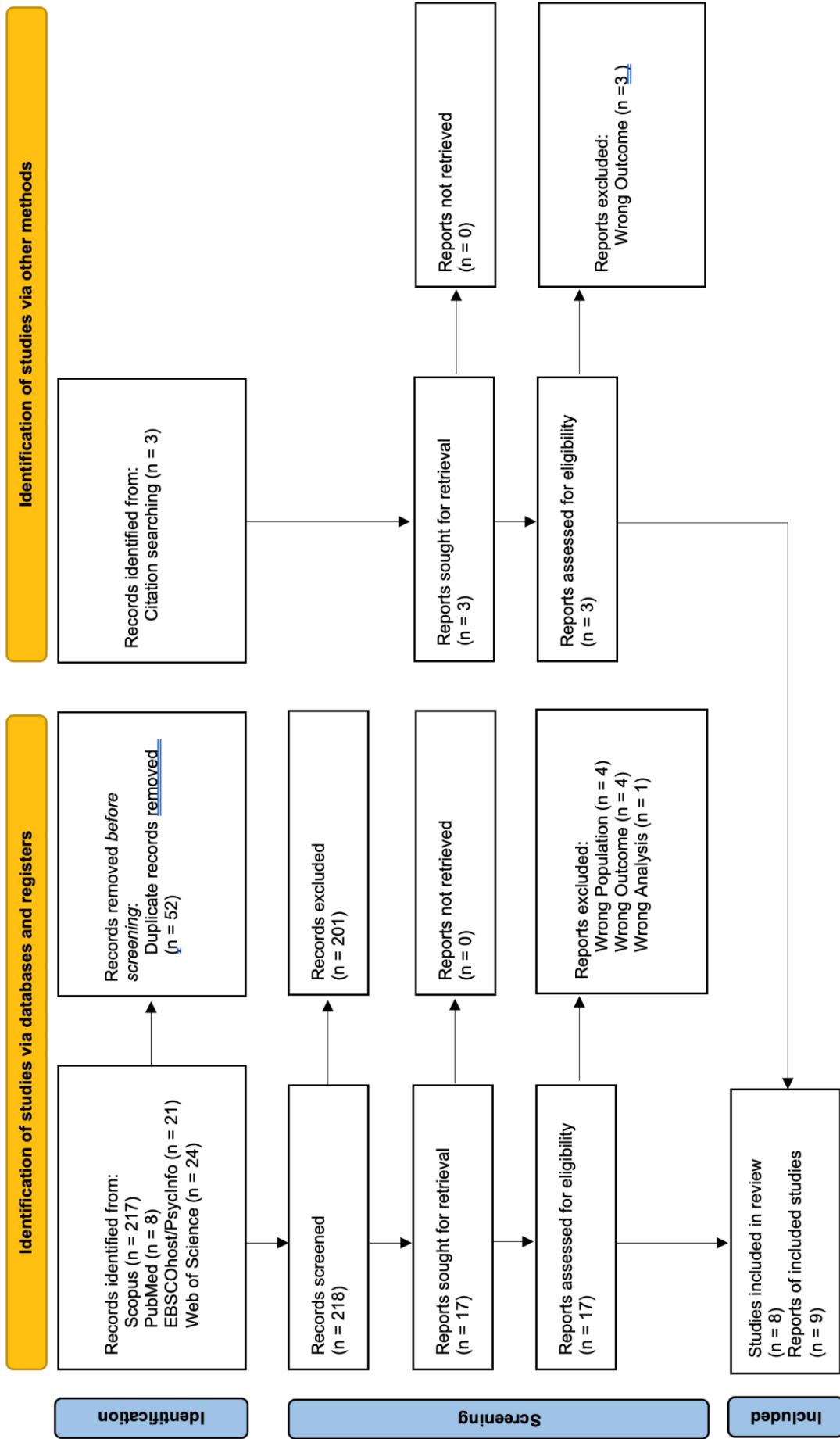
Results

A total of 270 records were screened through Scopus (n = 217), PubMed (n = 8), EBSCOhost/PsycInfo (n = 21) and Web of Science (n = 24). After duplication removal and title and abstract screening, a total of 17 full-text articles were assessed for eligibility, of which 8 were retained for inclusion in the review (Figure 1).

Of the excluded articles, 4 were due to using the wrong population, meeting exclusion criteria 1. It is important to note that, in many cases, depression measures might be considered to eliminate their potential confounding effect or to test moderation/mediation on the studied hypothesis. In Pillersdorf and Scoboria (2009), depression was measured; however, it was used to test a mediation effect between cannabis users and the FAB and therefore excluded from the review. Furthermore, 7

studies were excluded due to wrong outcome, meaning they met exclusion criteria 2. Most of these studies measured mood outcomes and not the FAB or FAB-Like effect, (e.g., Colombo et al. (2020) measured Affect Recall Bias). At first glance, it may seem a synonym for the FAB; however, this bias refers to the overestimation of past affect and not to FAB. Participants did a daily register of their affect, measuring the extent to which participants felt positive emotions against negative emotions at that moment, using items from the PANAS scale. Participants were asked to report on their original affect score, and not provide an affect score to the recall of the event, as it would be expected in a FAB study. Finally, one of the studies was excluded due to the way depression was used in statistical analysis. Although the correct population and outcome were present, the analysis conducted did not consider any association between depression or depressive symptoms and the FAB. In Gibbons et al. (2018) the authors tested to see if grief and death attitudes predicted the FAB in the context of death. In that study, the authors considered depression as a confounding variable, therefore accounting for depression's effect on predicting FAB; this is not a reason to exclude the article. Articles that use depression as a confounding variable, generally report an interaction outcome between initial event valence and depression, (i.e., how depression predicts fading affect based on initial event valence). However, even though the authors might have taken this metric into account, they have not reported the value of this interaction.

Figure 2 – Prisma Flow Diagram (Page et al., 2021)



A total of 8 studies met inclusion criteria and were considered for further analysis (see Table 1 for an overview of the findings).

Studies in which Depression was a confounding variable or moderator.

Three out of the eight final studies treated depression symptoms as a confounding variable. Gibbons et al. (2017) tried to understand FAB outcomes in the context of social media, arguing that social-media dependency is positively related to depression and other psychological stress variables, and therefore testing the hypothesis that depression moderated this association. The authors also accounted for the depression effect with the Hayes Model 1 (Hayes, 2012). This model evaluates the effect of initial event valence (in this case, either pleasant or unpleasant), depression as a continuous or dichotomous moderator (most studies use depression as a continuous variable, instead of creating a dividing line between two groups), and fading affect. It measures how depression moderates the connection between initial event valence and fading affect, therefore allowing for a statistical reference of how depression predicts the FAB (see Figure 2 for a visual representation).

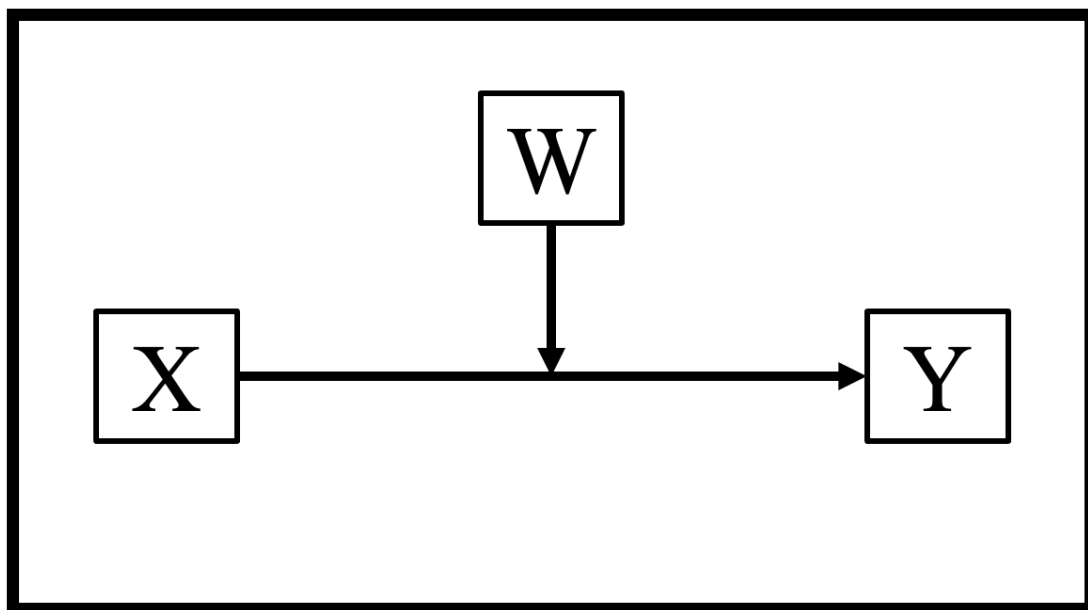


Figure 3 – Visual representation PROCESS Model 1 adapted from Hayes (2012)

Note: In the case of this study and for future reference, the x is dichotomous (i.e., pleasant or unpleasant initial event), the w - depression rating - is treated as continuous, and the y represents fading affect.

Table 1 – Summary of results for studies included in the review

Study	Sample	Depression measures	FAB measure	Analysis	Findings
Walker et al. (2003)	Exp. 1: $N = 65$ Exp 2: $N = 337$	BDI	Exp 1: 6 events (positive and negative) from the past 6 months rated in a 21 point-Likert scale for pleasantness and age of the event. Exp 2: Same procedure as Exp 1 but using a 7-point Likert Scale.	Mixed-factor analysis of variance.	The FAB is disrupted by dysphoria, with dysphoric showing a smaller fading affect. Across time FAB for dysphorics showed negative affect fading slower and positive affect fading faster when compared to non-dysphorics. The disrupted FAB in dysphoric is driven by current memory for event and not initial affect rating.
Gibbons et al. (2017)	$N = 234$	DASS	8 total events from the previous week, divided by 4 social media related events and 4 non-social media events, equally divided into positive and negative. 7-point Likert scale for pleasantness.	FAB regression coefficients across quintile of depression ratings Two-way interaction between depression and initial event affect	FAB become non-significant in higher levels of depression ratings. FAB decreased with Depression ratings, mostly because fading affect increased for positive events. FAB was negatively related to depression.
Gibbons & Lee (2019)	$N = 1006$	DASS	FAB protocol with a 7-point Likert Scale	Two-way interaction between depression and initial event affect FAB regression coefficients across quintile of depression ratings	FAB become non-significant in higher levels of depression ratings. FAB decreased with Depression ratings, mostly because fading affect increased for positive events. FAB disappeared at higher levels of depression.
Marsh et al. (2019)	$N = 296$	BDI	FAB protocol with a 7-point Likert Scale	Multi-level modeling	High BDI scores were associated with lower affect fade in general. FAB was entirely absent in participants with high ratings in depressive symptomatology

Gibbons & Bouldin (2019)	<i>N</i> = 279	DASS	7-point FAB protocol for 8 events (4 related to videogames and 4 non-related with equally divide positive and negative valence)	Two-way interaction between depression and initial event affect FAB regression coefficients across quintile of depression ratings	FAB become non-significant in higher levels of depression ratings. Depression had a negative effect on the FAB.
Kim & Yoon (2020)	<i>N</i> = 70	Clinical interview (SCID for DSM-IV) BDI-II	Emotions interview (Participants shared one specific life event corresponding to the happiest, sad, and most anxious moments. Afterward affect ratings for event occurrence and event recall were given.	No direct interaction effect. However, the study presents means and standard deviation for each of the affect ratings in both groups	Compared to controls, MDD participants had less fade for negative memories and bigger for happy memories. Emotional intensity of the happiest and saddest memories faded equally over time
Hitchcock et al. (2020)	<i>N</i> = 44	Clinical interview (SCID for DSM-IV) BDI	7-Point Likert scale for emotion at occurrence and emotion at recall of the event	One-way ANCOVA with FAB as the dependent variable	FAB was significantly attenuated in clinically diagnosed MDD participants compared to the control group of never depressed individuals. The FAB was attenuated, however, it was not absent or reversed in participants with MDD.
Bond et al. (2022)	<i>N</i> = 178	CES-D	7-point Likert scale after random assignment to 1 of 3 conditions: positive memory, negative memory, memory about the death of a loved one.	Correlation between the absolute value of the FAB and depression scores.	No significant correlation between depressive symptoms and FAB.

Notes: BDI – Beck Depression Inventory; DASS - Depression, Anxiety, and Stress Scale; SCID – Structured Clinical Interview for DSM Disorders CES-D – Center for Epidemiologic Studies Depression Scale

In Gibbons et al. (2017), depression was a statistically significant predictor of the FAB. Additionally, the study found that as depression ratings increased (i.e., more symptoms), fading affect decreased. This result means that the mean affect change of both negative and positive events was similar, suggesting that the FAB may not occur in individuals with higher depressive symptoms. The FAB became non-significant at higher depression ratings, meaning there were no significant differences in the means of fading affect for positive and negative events. This absence of FAB in higher depression ratings is explained by the authors not only due to an attenuated fading affect for negative memories but also because of an accelerated fading affect for positive memories (Gibbons et al., 2017).

Gibbons and Bouldin (2019) conducted a study to understand if video game-related events would lead to a dampened FAB, considering evidence linking video game abuse to poor emotional regulation. Again, depression was considered as a moderator of the FAB, and in line with the previous study, using Hayes (2012) Model 1 similar results were replicated. Depression ratings were negatively related to the FAB, meaning a higher depression rating would lead to a lower affect fade, with FAB becoming non-significant at higher levels of depression (Gibbons & Bouldin, 2019).

Finally, within this group of studies, Bond et al. (2022) aimed to see if the FAB could be replicated in extreme emotional memories, referring to the death of loved ones. Depression ratings gathered from the CES-D questionnaire were directly correlated with the absolute value of the fading effect, resulting in a negative correlation as expected; however, not significant. The authors suggested that the research design used may have been underpowered for moderation effects, which can help to understand this lack of significance.

Studies that compared clinically depressed vs healthy individuals

Two of the studies used clinically depressed individuals, and both studies used the same interview (Structured Clinical Interview for DSM-IV; SCID) to confirm diagnosis (Hitchcock et al., 2020; Kim & Yoon, 2020). In both studies, independent reviewers achieved perfect agreement ($k = 1.00$) for the diagnosis of MDD after a different researcher conducted and recorded the clinical interview. Both studies used the BDI to exclude healthy participants scoring above a clinical cut-off.

Kim and Yoon (2020) had participants undergo an emotions interview in which each reported one specific life event concerning the happiest, saddest, and most anxious moments. Participants then gave a detailed description of the reported events, unrestricted by time, to an interviewer blind to their grouping condition (MDD or healthy). The interview was recorded, and two trained coders rated the participant's memory according to its specificity, valence rating, and remoteness. After the interview, the participants rated their emotions at event occurrence and recall on a 10-point scale for each memory. The results showed large statistically significant effect sizes for depression's interaction with the values of elicited emotion at recall, both for positive ($\eta^2 = 0.56$) and negative events ($\eta^2 = 0.58$). In a direct comparison to the control group, the MDD participants showed again statistically significant effect sizes reporting lower happiness and higher sadness at event recall ($d = 0.65$ and $d = 0.63$, respectively). The authors also provided means and standard deviations for each event in both groups, which in turn allows us to directly compare the FAB between groups, with the MDD group reporting on average almost three times the affect fade concerning the happiest memory compared to control (MDD = 2.39; control = 0.87) and close to half affect fade in the negative memories (MDD = 1.87; control = 3.27). This study replicated the FAB and depression effect, with a clinical sample showing less fading for negative emotion. Also, the authors saw that both positive and negative affect seemed to fade at the same time, pointing to similar findings to the previously cited studies: at higher levels of depression rating, the FAB seemed to decrease - or outright disappear - because both pleasant and unpleasant affect faded at the same time (Gibbons et al., 2017; Gibbons & Bouldin, 2019).

Hitchcock et al. (2020) had participants undertaking the Good Day-Bad Day Task, an autobiographical categoric fluency task where they would remember as many good and bad events in two 2-minute periods as they could. Participants were instructed to provide specific memories while doing so. After this initial task, participants were echoed the events they gave and offered a description of them, allowing researchers to code the memories for specificity. Afterward, on a 7-point scale, the participants were asked to rate the event regarding emotion at event occurrence and recall. Results revealed that the FAB was significantly larger in the never-depressed group when compared to the MDD group, revealing an attenuated, but not absent, FAB in MDD patients. The authors also found a small effect size for affect fade for positive memories across both groups and a moderate effect size in negative memories; however, both were non-significant which

could be due to the small sample size (N = 44; 21 of which on the MDD group) (Hitchcock et al., 2020).

The original FAB and depression study

Walker et al. (2003a) study was the first to explore the association between depressive symptoms and the FAB. In their study, the authors ran two experiments. In experiment 1 (N = 65), participants answered the BDI and elicited six emotionally intense memories, both pleasant and unpleasant, from the previous six months. Participants then rated the memories on emotional valence and intensity at occurrence and recall. Additionally, participants also estimated the time when the event happened to attenuate for possible effects of event age. FAB was obtained by computing the difference of the ratings given for emotion at occurrence and recall. A mixed-factor analysis was conducted between dysphoria and initial event valence (emotion at occurrence) using a two-by-two design. This means that BDI ratings were treated as a dichotomic variable, with participants scoring 10 or above being considered dysphoric and participants scoring <10 as non-dysphoric (this line is consistent with Beck and Steer's (1987) BDI criteria). The authors reported that because most of the dysphoric participants fell into the mild depression category, a simpler distinction between subjects was warranted. Results showed a significant effect, with dysphoria predicting lower affect fade. Also, the results pointed out that unpleasant affect faded significantly more for the non-dysphoric group, that was not the case for the dysphoric participants (Walker et al., 20003a).

In experiment 2 (Walker et al., 20003a), the authors attempted to replicate the effects of the previous experiment but with a larger sample (N = 337) divided across three different replications; the same procedure was conducted across all. The difference was that participants were further divided into five categories to assess if the attenuation in the FAB was associated with a gradual increase in BDI ratings or if there was a critical point where the FAB started to become dampened. Each category had an approximate number of subjects and ranged from low to high non-dysphoric (BDI < 8), marginally dysphoric (BDI ranging from 8-12), and dysphoric (BDI score of 13 or above). The results followed what was found in experiment 1, with dysphoria predicting the fading affect (regardless of the use of the BDI score as a continuous variable or dichotomic as in the previous experiment). Higher levels in BDI rating meant increased fading of positive and decreased fading of negative affect. Further analysis using each of the referred categories found that, although the FAB was significant across lower categories, it was non-

significant in higher levels of BDI ratings. The authors also suggested that a score of 10 in the BDI appeared to be the cutoff point at which the FAB started to decrease (Walker et al., 20003a).

Studies that test mediators for the association between FAB and depression

Gibbons and Lee (2019) aggregated data from four of their studies (three of which did not report depression data, and one was under review at the time of the literature search and, therefore were not accounted for in the present study), to understand if rehearsal mediated the association between depression and the FAB. Participants (N = 1006) described four different events and rated them for affect at occurrence and recall. Additionally, they completed the DASS. Using the PROCESS Model 1 (2012), as explained above, authors found a significant interaction between depression ratings and the FAB, with depression predicting the FAB. Replicating results from the previous studies, higher values of depression rating showed smaller levels of FAB. As with previous studies, the FAB became non-significant at higher levels of depression, meaning there were no significant differences in the means of fading affect of pleasant and unpleasant events (Gibbons & Lee, 2019).

Marsh et al. (2019) had participants (N = 302) recall eight memories, four pleasant and four unpleasant, rating them on vividness, rehearsal, and affect at occurrence and recall, using a 7-point Likert scale. Participants also completed the BDI and the BAI, which measures the presence of anxiety symptoms. Using multilevel modeling, researchers found that higher BDI scores predicted lower affect fade. This effect occurred regardless of memory valence, meaning both positive and negative affect faded at similar levels, representing a faster positive affect fade and a slower negative affect fade. Again, the study also found that the FAB was absent in people with higher BDI ratings, as their affect faded similarly for negative and for positive events. Interestingly, anxiety was not predictive of lower affect fade; it only happened when depressive and anxiety symptoms were present. Additionally, the authors found that, when anxiety and depression symptoms were present, the latter were related to lower affect fade only in high ratings of anxiety. The authors suggested that the moderating effect anxiety has on FAB might be due to the presence of depressive symptoms (Marsh et al., 2019).

Discussion

This review aimed to establish what is currently known about the association between FAB and depressive symptoms and to inform potential clinical and future research implications. The findings from the reviewed studies looking at the association between FAB and depressive symptoms suggest that these disrupt the FAB by making its overall effect smaller. Throughout the reviewed studies depressive symptoms appeared to accelerate the fading affect for positive autobiographical memories and slow down the affect fade for negative autobiographical memories. Across the reviewed studies, event time (how long ago it happened) and initial affect intensity - variables known to affect the FAB -were not significant in mediating the association between FAB and depression (besides a partial mediation effect of rehearsal, discussed further below), suggesting the existence of an actual interaction between depression and FAB and not an extra confounding variable responsible for this interaction.

All reviewed studies reported an interaction between the two variables, with only one stated to be nonsignificant (Bond et al., 2022). In this study, depression was correlated with the FAB as an absolute value. As FAB has been shown to become nonsignificant at higher levels of depression (e.g., Gibbon et al., 2017; Gibbons & Bouldin, 2019; Gibbons & Lee, 2019; Marsh et al., 2020), it would be plausible to suggest that in linear regression, and assuming FAB as nonsignificant in higher levels of depression (due to the same affect fade for both pleasant and unpleasant events) when depression is treated as a continuous variable, this correlation would become nonsignificant. Also, the methodology for data analysis in Bond et al. (2022) differs from most studies where depression acts as a moderating variable of the FAB instead of a direct correlation. Also, the difference in methodology may play an important role when we consider what the FAB is meant to represent and how depression plays a role in that (more information below). The authors of the study also suggest that the performed data analysis might have not been powerful enough to account for other effects besides the main objective of the study (Bond et al., 2022). Another important thing to mention is that the study was conducted via an online survey during the coronavirus pandemic. During the coronavirus outbreak, depression prevalence was reportedly higher, as seen across a wide variety of studies (Balakrishnan et al., 2022; Dettmann et al., 2022; Hajek et al. 2022; Kavvadas et al. 2022; Peng et al., 2022; Yuan, et al., 2022) which may play a factor in the depression measure.

Across all studies, except Bond et al. (2022), the FAB was robustly replicated. Furthermore, depression was always a statistically significant predictor of the FAB. Across all studies, even if non-significant, depression symptoms maintain the same effect on FAB: the higher the depression rating, the lower the FAB. In addition, Gibbons et al. (2017), Gibbons and Bouldin (2019), Gibbons and Lee (2019), and Marsh et al. (2020) found that the FAB became non-significant at higher depression ratings, suggesting that the difference in means of fading affect between the different event valences would cancel out, meaning positive and negative affect would fade at the same time. Contrary to this idea, the studies that used clinical samples found that the FAB still exists at higher levels of depression; although in Kim and Yoon's (2020) study, positive and negative affect faded at the same time. It is important to note that Kim and Yoon's (2020) data analysis has not computed the FAB as in previous research. Also, Walker et al. (2003) did not find any evidence that the FAB loses significance at higher levels of depression rating. An important distinction of the aforementioned studies is that, in those where the FAB did not lose significance at higher levels of depression rating, depression was computed as a dichotomic variable (MDD vs. Healthy and Dysphoric vs. Non-Dysphoric); whereas in the ones that found the FAB lost significance at higher levels of depression ratings, the depression variable was treated as a continuous variable, suggesting that different ways to compute this variable might explain this difference.

Based on the reviewed studies and the results presented, it would be suggestive to report that depression does predict and disrupt the FAB, and this happens by making negative affect fade slower and positive affect faster. However, it is important to note that the sample size for this review is not large, and more studies are needed to further confirm this hypothesis.

Future research implications

One pertinent question this review spurred was that some studies found that in higher depression ratings, FAB becomes non-significant, meaning FAB is inexistent in individuals with higher levels of depressive symptoms. Other studies still found FAB to be present (and significant), although reduced, in higher levels of depressive symptoms. Across all the studies that found FAB to become non-significant, the depression variable was treated as continuous, as opposed to those that treated depression as a dichotomic variable, and found the FAB to remain significant. Future research should understand if the FAB can be replicated at higher levels of depression. Samples of clinically diagnosed

depressed patients could be analyzed separately by different levels of severity to better understand how the association between the FAB and depression evolves over depression severity levels.

Another possible research direction could be to test for anxiety moderation. One of the studies found that in comorbid situations depressive symptoms only disrupted the FAB at higher levels of anxiety ratings, having no effect on lower anxiety ratings. This analysis was only done because - contrary to what was assumed - anxiety did not moderate the FAB. Anxiety has mostly been treated as a continuous variable, reporting similar results to those of depressive symptoms, however, there might be a strong rationale that points to the idea that this happens due to the high comorbidity between anxiety and depression and that depressive symptoms might be responsible for this FAB disruption. Research using different samples of both clinical anxiety and depression patients could offer better insight into this question.

Another possible way for research concerns the potential bi-directionality of the association between FAB and depression, with FAB representing a predictor of depression. Using memory bias to assess future risk for depression is not a new idea. *Overgeneral memory* has been reliably established as a predictor of the course of depression (Hallford et al., 2021; Sumner et al., 2010), as well as an indicator of vulnerability towards depression (Gibbs & Rude, 2004); In fact, Gibbs & Rude's (2004) study may provide a solid basis for future replications using the FAB effect.

The rationale behind this potential bidirectional relationship between FAB and depression concerns the fact that assuming that the FAB is a result of adaptive and successful emotional regulation strategies, maladaptive strategies would lead to a poor FAB. Alongside, there is an extensive body of literature suggesting that maladaptive emotional regulation strategies can lead to and predict depressive symptoms occurrence (Abler et al., 2010; Atherton et al., 2015; Berking et al., 2014; O'Leary et al., 2016; Van Beveren et al., 2017; Van Rheezen et al., 2015), asserting maladaptive emotional regulation strategies as a risk factor for depression.

It is important to note that having poor emotional regulation strategies does not mean an individual will develop depression; however, if faced with stressful events, this individual will be less ready and capable of dealing with those, potentially leading to depression. To assess the validity of this suggestion, it would be important to test for a direct association between FAB and emotional regulation. If FAB works as a reflection

of adaptive emotional regulation, then individuals who do not present adaptive emotional regulation should not display a good FAB. This relationship would then work in the other direction: if otherwise healthy individuals do not present a strong FAB, one could assume that those individuals would present maladaptive emotional regulation. If this assumption is true, and assuming maladaptive emotional regulation as a risk factor and predictor of depression course and vulnerability, the FAB could be used to predict risk for future depression in healthy individuals.

Finally, although the results across the studies seem to be indicative of an association between depression and the FAB, the body of work is still limited. Moreover, the FAB is a relatively new concept that is worth exploring outside the 'FAB collective'. Efforts to better understand FAB's underlying mechanisms can also bring a new light into emotion regulation, and, if paired with culturally different samples, might inform how different cultures process positive and negative information.

Future practice implications

The FAB, as a reflection of successful emotional regulation, can inform practice in ways to better care for depressive patients. Emotional regulation-focused therapy might come as a big aid for those suffering from depression and, assessing their FAB might offer a way to directly work in troubled memories that still hold large emotional weight. Furthermore, since coping strategies are one of the underlying mechanisms underlying the FAB, coping-based intervention strategies might not only be helpful in patients with depression but also be an effective way to increase affect fade for negative events, present in depressed individuals. Also, the FAB measure may help to inform if emotional regulation-focused therapy or coping-based intervention is adequate for a patient. If someone has depression but appears to show a strong FAB with no disruption, the previously mentioned interventions might not be as adequate as they would be for someone who shows a dampened FAB.

Conclusion

This review aimed to understand the association between depression and the FAB and inform new research ideas and practical implications. Depression's effect on the FAB was robustly replicated across the reviewed studies. Depression predicts the FAB by accelerating the affect fade for positive memories while attenuating the affect fade for

negative ones. Because of the depression effect on the FAB, a lot of new research pathways worth exploring are opened. The FAB, resulting from successful emotional regulation strategies, can potentially inform the lack of these strategies. As maladaptive emotional regulation strategies are linked to the future onset of depression and depressive symptoms, the FAB emerges as a potential predictor of future depression. It is important to note that the FAB is still a relatively new concept, and there is still limited research on the topic. Therefore, the body of work used in this review might prove not to be extensive enough for further conclusions. Future research should focus on developing and improving the body of work available, as well as exploring the potential bidirectionality between depression and FAB.

References

- Abler, B., Hofer, C., Walter, H., Erk, S., Hoffmann, H., Traue, H. C., & Kessler, H. (2010). Habitual emotion regulation strategies and depressive symptoms in healthy subjects predict fMRI brain activation patterns related to major depression. *Psychiatry Research: Neuroimaging*, *183*(2), 105–113. <https://doi.org/10.1016/j.psychresns.2010.05.010>
- Akers, J., Aguiar-Ibáñez, R., & Baba-Akbari, A. (2009). Systematic reviews: CRD's guidance for undertaking reviews in health care. *Centre for Reviews and Dissemination*, University of York https://www.york.ac.uk/media/crd/Systematic_Reviews.pdf.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- American Psychiatric Association. (n.d.a). Coping. In *APA Dictionary*. Retrieved July 12, 2023, from <https://dictionary.apa.org/coping>
- American Psychiatric Association. (n.d.b). Rehearsal. In *APA Dictionary*. Retrieved July 12, 2023, from <https://dictionary.apa.org/rehearsal>
- Atherton, B. D., Nevels, R. D., & Moore, M. (2015). Predicting Symptoms of Depression From Social Anhedonia and Emotion Regulation. *Nervous and Mental Disease*, *203*(3), 170–174. <https://doi.org/10.1097/nmd.0000000000000262>
- Balakrishnan, V., Seong, N. K., Kaur, W., Govaichelvan, K., & Lee, Z. J. (2022). COVID-19 depression and its risk factors in Asia Pacific – A systematic review and meta-

- analysis. *Journal of Affective Disorders*, 298, 47–56. <https://doi.org/10.1016/j.jad.2021.11.048>
- Beck, A. T. (Ed.). (1979). *Cognitive therapy of depression*. Guilford press.
- Beck, A. T., & Steer, R. A. (1987). *Beck depression inventory manual*. New York: Harcourt Brace Jovanovich.
- Beike, D. R., & Wirth-Beaumont, E. T. (2005). Psychological closure as a memory phenomenon. *Memory*, 13(6), 574–593. <https://doi.org/10.1080/09658210444000241>
- Berking, M., Wirtz, C. M., Svaldi, J., & Hofmann, S. G. (2014). Emotion regulation predicts symptoms of depression over five years. *Behaviour Research and Therapy*, 57, 13–20. <https://doi.org/10.1016/j.brat.2014.03.003>
- Bond, G. R., Speller, L. F., Jiménez, J. C., Smith, D. M., Marin, P. G., Greenham, M. B., Holman, R. D., & Varela, E. (2022). Fading affect bias in Mexico: Differential fading of emotional intensity in death memories and everyday negative memories. *Applied Cognitive Psychology*, 36(5), 1022–1033. <https://doi.org/10.1002/acp.3987>
- Breslow, R. E., Kocsis, J. H., & Belkin, B. M. (1981). Contribution of the depressive perspective to memory function in depression. *American Journal of Psychiatry*, 138(2), 227–230. <https://doi.org/10.1176/ajp.138.2.227>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310–357. <https://doi.org/10.1037/0033-2909.98.2.310>
- Colombo, D., Suso-Ribera, C., Fernández-Álvarez, J., Cipresso, P., García-Palacios, A., Riva, G., & Botella, C. (2020). Affect Recall Bias: Being Resilient by Distorting Reality. *Cognitive Therapy and Research*, 44(5), 906–918. <https://doi.org/10.1007/s10608-020-10122-3>
- Coombs, N., Meriwether, W. E., Caringi, J., & Newcomer, S. R. (2021). Barriers to healthcare access among U.S. adults with mental health challenges: A population-based study. *SSM-Population Health*, 15, 100847. <https://doi.org/10.1016/j.ssmph.2021.100847>

- Coughlin, S. S. (1990). Recall bias in epidemiologic studies. *Journal of Clinical Epidemiology*, 43(1), 87–91. [https://doi.org/10.1016/0895-4356\(90\)90060-3](https://doi.org/10.1016/0895-4356(90)90060-3)
- Dettmann, L. M., Adams, S., & Taylor, G. M. J. (2022). Investigating the prevalence of anxiety and depression during the first COVID-19 lockdown in the United Kingdom: Systematic review and meta-analyses. *British Journal of Clinical Psychology*, 61(3), 757–780. <https://doi.org/10.1111/bjc.12360>
- Diogo Pereira, Mafalda Marques, Inês Almeida, Raquel Lemos. A Systematic Review to evaluate the association between Fading Affect Bias and depressive symptoms. PROSPERO 2023 CRD42023411210 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42023411210
- Eysenck, M. W., Payne, S., & Santos, R. (2006). Anxiety and depression: Past, present, and future events. *Cognition & Emotion*, 20(2), 274–294. <https://doi.org/10.1080/02699930500220066>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066x.56.3.218>
- Gibbons, J. A., Lee, S. A., & Walker, W. R. (2010). The fading affect bias begins within 12 hours and persists for 3 months. *Applied Cognitive Psychology*, 25(4), 663–672. <https://doi.org/10.1002/acp.1738>
- Gibbons, J. A., Horowitz, K. A., & Dunlap, S. M. (2017). The fading affect bias shows positive outcomes at the general but not the individual level of analysis in the context of social media. *Consciousness and Cognition*, 53, 47–60. <https://doi.org/10.1016/j.concog.2017.05.009>
- Gibbons, J. A., Lee, S. A., Fehr, A. M. A., Wilson, K. J., & Marshall, T. (2018). Grief and Avoidant Death Attitudes Combine to Predict the Fading Affect Bias. *International Journal of Environmental Research and Public Health*, 15(8), 1736. <https://doi.org/10.3390/ijerph15081736>
- Gibbons, J. A., & Bouldin, B. (2019). Videogame play and events are related to unhealthy emotion regulation in the form of low fading affect bias in autobiographical

- memory. *Consciousness and Cognition*, 74, 102778. <https://doi.org/10.1016/j.concog.2019.102778>
- Gibbons, J. A., & Lee, S. A. (2019). Rehearsal partially mediates the negative relations of the fading affect bias with depression, anxiety, and stress. *Applied Cognitive Psychology*. <https://doi.org/10.1002/acp.3538>
- Gibbs, B., & Rude, S. S. (2004). Overgeneral Autobiographical Memory as Depression Vulnerability. *Cognitive Therapy and Research*, 28(4), 511–526. <https://doi.org/10.1023/b:cotr.0000045561.72997.7c>
- Hajek, A., Sabat, I., Neumann-Böhme, S., Schreyögg, J., Barros, P. P., Stargardt, T., & König, H. (2022). Prevalence and determinants of probable depression and anxiety during the COVID-19 pandemic in seven countries: Longitudinal evidence from the European COvid Survey (ECOS). *Journal of Affective Disorders*, 299, 517–524. <https://doi.org/10.1016/j.jad.2021.12.029>
- Hallford, D. J., Rusanov, D., Yeow, J. J. E., & Barry, T. J. (2021). Overgeneral and specific autobiographical memory predict the course of depression: an updated meta-analysis. *Psychological Medicine*, 51(6), 909–926. <https://doi.org/10.1017/s0033291721001343>
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling
- Hitchcock, C., Newby, J. M., Timm, E., Howard, R., Golden, A., Kuyken, W., & Dalgleish, T. (2020). Memory category fluency, memory specificity, and the fading affect bias for positive and negative autobiographical events: Performance on a good day–bad day task in healthy and depressed individuals. *Journal of Experimental Psychology: General*, 149(1), 198–206. <https://doi.org/10.1037/xge0000617>
- Hitchcock, C., Rees, C., & Dalgleish, T. (2017). The devil’s in the detail: Accessibility of specific personal memories supports rose-tinted self-generalizations in mental health and toxic self-generalizations in clinical depression. *Journal of Experimental Psychology: General*, 146(9), 1286–1295. <https://doi.org/10.1037/xge0000343>

- Jersild, A. (1931). Memory for the pleasant as compared with the unpleasant. *Journal of Experimental Psychology*, 14(3), 284–288. <https://doi.org/10.1037/h0074453>
- Joormann, J., Waugh, C. E., & Gotlib, I. H. (2015). Cognitive Bias Modification for Interpretation in Major Depression. *Clinical Psychological Science*, 3(1), 126–139. <https://doi.org/10.1177/2167702614560748>
- Kavvadas, D., Kavvada, A., Sofia, K., Papaliagkas, V., Cheristanidis, S., Chatzidimitriou, M., & Papamitsou, T. (2022). Stress, Anxiety and Depression Prevalence among Greek University Students during COVID-19 Pandemic: A Two-Year Survey. *Journal of Clinical Medicine*, 11(15), 4263. <https://doi.org/10.3390/jcm11154263>
- Kim, D., & Yoon, K. L. (2020). Emotional response to autobiographical memories in depression: less happiness to positive and more sadness to negative memories. *Cognitive Behaviour Therapy*, 49(6), 475–485. <https://doi.org/10.1080/16506073.2020.1765859>
- Lattie, E. G., Stiles-Shields, C., & Graham, A. L. (2022). An overview of and recommendations for more accessible digital mental health services. *Nature Reviews Psychology*, 1(2), 87–100. <https://doi.org/10.1038/s44159-021-00003-1>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.
- Levin, R. S., Heller, W., Mohanty, A., Herrington, J. D., & Miller, G. E. (2007). Cognitive Deficits in Depression and Functional Specificity of Regional Brain Activity. *Cognitive Therapy and Research*, 31(2), 211–233. <https://doi.org/10.1007/s10608-007-9128-z>
- Lewis, P. A., & Critchley, H. D. (2003). Mood-dependent memory. *Trends in Cognitive Sciences*, 7(10), 431–433. <https://doi.org/10.1016/j.tics.2003.08.005>
- Loeffler, L. a. K., Huebben, A. K., Radke, S., Habel, U., & Derntl, B. (2020). The Association Between Vulnerable/Grandiose Narcissism and Emotion Regulation. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.519330>

- Marsh, C., Hammond, M. D., & Crawford, M. R. (2019). Thinking about negative life events as a mediator between depression and fading affect bias. *PLOS ONE*, *14*(1), e0211147. <https://doi.org/10.1371/journal.pone.0211147>
- Meltzer, H. Y. (1930). Individual differences in forgetting pleasant and unpleasant experiences. *Journal of Educational Psychology*, *21*(6), 399–409. <https://doi.org/10.1037/h0073944>
- Meltzer, H. Y. (1931). Sex differences in forgetting pleasant and unpleasant experiences. *The Journal of Abnormal and Social Psychology*. <https://doi.org/10.1037/h0071952>
- National Collaborating Centre for Mental Health (UK): NCCMH. *Common Mental Health Disorders: Identification and Pathways to Care. Leicester (UK): British Psychological Society (UK)*; 2011. (NICE Clinical Guidelines, No. 123.) 4, ACCESS TO HEALTHCARE. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK92265/>
- O’Leary, K. D., Bylsma, L. M., & Rottenberg, J. (2016). Why might poor sleep quality lead to depression? A role for emotion regulation. *Cognition & Emotion*, *31*(8), 1698–1706. <https://doi.org/10.1080/02699931.2016.1247035>
- Ordem dos Psicólogos. (2020). *COVID-19: “Com 2,5 psicólogos por 100 mil habitantes não será possível responder ao impacto psicológico desta crise” | Ordem dos Psicólogos*. <https://www.ordemdospsicologos.pt/pt/noticia/2826>
- Ouzzani, M., Hammady, H. M., Fedorowicz, Z., & Elmagarmid, A. K. (2016). Rayyan—a web and mobile app for systematic reviews. *Systematic Reviews*, *5*(1). <https://doi.org/10.1186/s13643-016-0384-4>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T., Mulrow, C. D., Shamseer, L., Tetzlaff, J., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E., Mayo-Wilson, E., McDonald, S., . . . Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, *n71*. <https://doi.org/10.1136/bmj.n71>
- Peng, X., Liang, S., Liu, L., Cai, C., Chen, J., Andi, H., Wang, X., & Gregersen, H. (2022). Prevalence and associated factors of depression, anxiety and suicidality among

- Chinese high school E-learning students during the COVID-19 lockdown. *Current Psychology*. <https://doi.org/10.1007/s12144-021-02512-x>
- Pillersdorf, D., & Scoboria, A. (2019). Cannabis-associated impairments in the fading affect bias and autobiographical memory specificity. *Consciousness and Cognition*, *74*, 102792. <https://doi.org/10.1016/j.concog.2019.102792>
- Ritchie, T. D., Batteson, T. J., Bohn, A., Crawford, M. R., Ferguson, G., Schrauf, R. W., Vogl, R. J., & Walker, W. R. (2014). A pancultural perspective on the fading affect bias in autobiographical memory. *Memory*, *23*(2), 278–290. <https://doi.org/10.1080/09658211.2014.884138>
- Ritchie, T. D., & Skowronski, J. J. (2008). Perceived change in the affect associated with dreams: The fading affect bias and its moderators. *Dreaming*, *18*(1), 27–43. <https://doi.org/10.1037/1053-0797.18.1.27>
- Ritchie, T. D., Skowronski, J. J., Hartnett, J. N., Wells, B. M., & Walker, W. R. (2009). The fading affect bias in the context of emotion activation level, mood, and personal theories of emotion change. *Memory*, *17*(4), 428–444. <https://doi.org/10.1080/09658210902791665>
- Ritchie, T. D., Skowronski, J. J., Wood, S. M., Walker, W. R., Vogl, R. J., & Gibbons, J. A. (2006). Event self-importance, event rehearsal, and the fading affect bias in autobiographical memory. *Self and Identity*, *5*(2), 172–195. <https://doi.org/10.1080/15298860600591222>
- Ritchie, T. D., Walker, W. R., Marsh, S., Hart, C. A., & Skowronski, J. J. (2014). Narcissism Distorts the Fading Affect Bias in Autobiographical Memory. *Applied Cognitive Psychology*, *29*(1), 104–114. <https://doi.org/10.1002/acp.3082>
- Schrauf, R. W., & Hoffman, L. (2007). The effects of revisionism on remembered emotion: the valence of older, voluntary immigrants' pre-migration autobiographical memories. *Applied Cognitive Psychology*, *21*(7), 895–913. <https://doi.org/10.1002/acp.1304>
- Sedikides, C., & Alicke, M. D. (2012). Self-Enhancement and Self-Protection Motives. In *Oxford University Press eBooks* (pp. 303–322). <https://doi.org/10.1093/oxfordhb/9780195399820.013.0017>

- Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-Regulation Choice. *Psychological Science*, 22(11), 1391–1396. <https://doi.org/10.1177/0956797611418350>
- Skinner, A., Occhipinti, J., Song, Y. J. C., & Hickie, I. B. (2022). Population mental health improves with increasing access to treatment: evidence from a dynamic modelling analysis. *BMC Psychiatry*, 22(1). <https://doi.org/10.1186/s12888-022-04352-w>
- Skowronski, J. J., & Walker, W. R. (2004). How Describing Autobiographical Events Can Affect Autobiographical Memories. *Social Cognition*, 22(5), 555–590. <https://doi.org/10.1521/soco.22.5.555.50764>
- Skowronski, J. J., Walker, W. R., Henderson, D. X., & Bond, G. R. (2014). The Fading Affect Bias. In *Advances in Experimental Social Psychology* (pp. 163–218). Elsevier BV. <https://doi.org/10.1016/b978-0-12-800052-6.00003-2>
- Sumner, J. A., Griffith, J. F., & Mineka, S. (2010). Overgeneral autobiographical memory as a predictor of the course of depression: A meta-analysis. *Behaviour Research and Therapy*, 48(7), 614–625. <https://doi.org/10.1016/j.brat.2010.03.013>
- Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization-minimization hypothesis. *Psychological Bulletin*, 110(1), 67–85. <https://doi.org/10.1037/0033-2909.110.1.67>
- Tugade, M. M., & Fredrickson, B. L. (2004). Resilient Individuals Use Positive Emotions to Bounce Back From Negative Emotional Experiences. *Journal of Personality and Social Psychology*, 86(2), 320–333. <https://doi.org/10.1037/0022-3514.86.2.320>
- Van Beveren, M., Harding, K. G., Beyers, W., & Braet, C. (2017). Don't worry, be happy: The role of positive emotionality and adaptive emotion regulation strategies for youth depressive symptoms. *British Journal of Clinical Psychology*, 57(1), 18–41. <https://doi.org/10.1111/bjc.12151>
- Van Rheenen, T. E., Murray, G., & Rossell, S. L. (2015). Emotion regulation in bipolar disorder: Profile and utility in predicting trait mania and depression propensity. *Psychiatry Research-neuroimaging*, 225(3), 425–432. <https://doi.org/10.1016/j.psychres.2014.12.001>

- Walker, W. R., Skowronski, J. J., Gibbons, J. A., Vogl, R. J., & Thompson, C. (2003a). On the emotions that accompany autobiographical memories: Dysphoria disrupts the fading affect bias. *Cognition & Emotion*, *17*(5), 703–723. <https://doi.org/10.1080/02699930302287>
- Walker, W. R., Skowronski, J. J., & Thompson, C. (2003b). Life is Pleasant—and Memory Helps to Keep it that Way! *Review of General Psychology*, *7*(2), 203–210. <https://doi.org/10.1037/1089-2680.7.2.203>
- Walker, W. R., & Skowronski, J. J. (2009). The Fading affect bias: But what the hell is it for? *Applied Cognitive Psychology*, *23*(8), 1122–1136. <https://doi.org/10.1002/acp.1614>
- Walker, W. R., Vogl, R. J., & Thompson, C. (1997). Autobiographical memory: unpleasantness fades faster than pleasantness over time. *Applied Cognitive Psychology*, *11*(5), 399–413. [https://doi.org/10.1002/\(sici\)1099-0720\(199710\)11:5](https://doi.org/10.1002/(sici)1099-0720(199710)11:5)
- Werner-Seidler, A., & Moulds, M. L. (2011). Autobiographical memory characteristics in depression vulnerability: Formerly depressed individuals recall less vivid positive memories. *Cognition & Emotion*, *25*(6), 1087–1103. <https://doi.org/10.1080/02699931.2010.531007>
- Williams, J. C., & Scott, J. F. (1988). Autobiographical memory in depression. *Psychological Medicine*, *18*(3), 689–695. <https://doi.org/10.1017/s0033291700008370>
- World Health Organization: WHO. (2021). Suicide. *www.who.int*. <https://www.who.int/news-room/factsheets/detail/suicide>
- World Health Organization: WHO. (2022). World mental health report: Transforming mental health for all. *www.who.int*. <https://www.who.int/publications/i/item/9789240049338>
- Yuan, K., Zheng, Y., Wang, Y., Sun, Y., Gong, Y., Huang, Y., Chen, X., Liu, X., Zhong, Y., Su, S., Gao, N., Lu, Y., Wang, Z., Liu, W., Que, J., Yang, Y., Zhang, A., Jing, M., Yuan, C., . . . Lu, L. (2022). A systematic review and meta-analysis on prevalence of and risk factors associated with depression, anxiety and insomnia

in infectious diseases, including COVID-19: a call to action. *Molecular Psychiatry*, 27(8), 3214–3222. <https://doi.org/10.1038/s41380-022-01638-z>