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The influence of shifts in visual perspective on emotion in event memories: A meta-analytical review

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Abstract

Memories for events can be remembered from an own eyes perspective, which mimics the original experience by visualizing the event through our own eyes, or from an observer-like perspective, such that we can visualize ourselves and our surroundings in the memory. Shifting across these two visual perspectives during retrieval influences how the emotional aspects of the events are recalled, although the effect differs based on the direction of shifting. While shifting from an own eyes to an observer-like perspective reduces emotion, shifting from an observer-like to an own eyes perspective does not. The current meta-analysis aimed to quantify this asymmetrical pattern of shifting perspectives on emotion in event memories. A multilevel model of 12 publications with 49 individual effects revealed a small effect (Hedges' g = -.255, 95% CI [-.359, -.151]), reflecting a reduction in emotion when shifting to a novel visual perspective compared to the initial viewpoint adopted. Moderator analyses revealed that this effect was significant when shifting from an own eyes to an observer-like perspective but not when shifting in the reverse direction. This asymmetrical pattern was associated with differences in the subjective vividness between initial and shifted conditions. Together, these results reveal that shifting perspective is a powerful way to reduce the emotions elicited in event memories by reshaping event characteristics. However, there are also limits in the effectiveness of this strategy in regulating emotional experiences.

Remember a specific event from your personal past, for example, the first time you went to the concert of your favorite band. Visualize the location of the stage, your location, and the excitement you feel when the band shows up. As you recreate the mental scenario of this event, from which point-of-view do you see it? Event memories, including autobiographical memories (AMs) from the personal past and episodic mental simulations, such as imagining future events and other hypothetical scenarios, require the construction of a scene from a particular visual perspective (Rubin & Umanath, 2015). People can adopt an own eyes perspective, in which they visualize events from a viewpoint where they were or would be located in the event, and an observer-like perspective, in which they could see themselves and their environment (Nigro & Neisser, 1983). Visual perspective influences the characteristics of remembering and imagining (e.g., for review see St. Jacques, 2022). For example, viewpoint influences how mental scenarios are constructed, such as the emotions that people attribute to events (for review, see Küçüktaş & St. Jacques, 2022). Moreover, a growing body of research has shown that shifting visual perspective by adopting a novel vantage point that differs from the initial perspective of the event (e.g., shifting from an own eyes to an observer-like perspective) also alters the characteristics of remembering and imagining (e.g., St. Jacques, 2019; Wardell et al., 2023). Returning to the example above, if you remember the concert memory from an own eyes perspective, you would likely have experienced more intense emotions than if you had taken an observer-like perspective. However, if you then shifted to an observer-like perspective such that you mentally visualize yourself and your surroundings in the same concert event, you would potentially experience a reduction in emotionality. The decrease in emotion due to shifting from an own eyes to an observer-like perspective is frequently reported (e.g., Akhtar et al., 2017; Berntsen & Rubin, 2006; King et al., 2022; Robinson & Swanson, 1993; St. Jacques et al., 2017). However, some studies have also shown that this effect is asymmetrical, such that shifting from an observer-like to an own eyes perspective does not impact the emotion associated with the events (e.g., Akhtar et al., 2017; Berntsen & Rubin, 2006; Robinson & Swanson, 1993; Vella & Moulds, 2014). Understanding the relationship between shifts in visual perspectives and emotion is critical given that visual perspective is frequently used as an emotional regulation strategy (Wallace-Hadrill & Kamboj, 2016; see also Powers & LaBar, 2019; Webb et al., 2012), and certain emotional disorders such as post-traumatic stress disorder (PTSD) are related to impairments in visual perspectives of memories (e.g., Berntsen et al., 2003; Kenny & Bryant, 2007; McIsaac & Eich, 2004). The present meta-analysis aims to elucidate how shifts in visual perspectives influence emotionality during the construction of event memories.

Shifting from an own eyes to an observer-like perspective generally reduces the emotionality of events (e.g., Akhtar et al., 2017; Berntsen & Rubin, 2006; King et al., 2022; Robinson & Swanson, 1993; St. Jacques et al., 2017; Vella & Moulds, 2014). For example, Berntsen and Rubin (2006) asked participants to remember events they initially recalled from an own eyes perspective by shifting to an observer-like perspective, which diminished the initial emotional intensity of the events. One reason for the reduced emotions experienced is that observer-like perspective, by nature, involves distancing ourselves from events as we step back from the center of these experiences. In contrast, own eyes perspectives mimic our typical and embodied experience of the world, thus supporting the experiential aspects of mental scenarios. These findings are consistent with theories of visual perspective and emotional regulation that highlight the role that viewpoint plays in the sense of immersion or distancing from events (e.g., Kross & Ayduk, 2017; Tausen et al., 2020; Trope & Liberman, 2010) as well as the sense of agency (Peeters et al., 2023).

Although people are also able to shift from an observer-like to an own eyes perspective, prior research has shown that shifting perspective in this direction has little to no impact on emotion (for review, see Küçüktaş & St. Jacques, 2022). For example, Sekiguchi and Nonaka (2014) asked participants to recall AMs from their naturally occurring visual perspective. Then, participants were asked to adopt the opposite perspective in the memory compared to their original viewpoint, either shifting from an own eyes to an observer-like perspective or vice versa. The authors found a reduction in the reported emotional intensity of memories when participants shifted from an own eyes to an observer-like perspective, but no changes when they shifted from an observer-like to an own eyes perspective. This asymmetrical pattern of effects of visual perspective on emotion has been consistently found in the literature (e.g., Berntsen & Rubin, 2006; Robinson & Swanson, 1993; Vella & Moulds, 2014). However, it is still unclear why shifting from an own eyes to an observer-like perspective is effective in altering emotions, but shifting in the reverse direction is not.

Shifting to a novel visual perspective is a mnemonic intervention that changes how people reconstruct events (St. Jacques, 2019; 2022; St. Jacques, 2023a), and therefore, its impact on emotion can be understood by examining how memory content is reassembled when adopting a novel viewpoint. Recent models argue that emotions triggered by mnemonic materials, such as AMs, can be diminished by modifying the accessibility of event details (Engen & Anderson, 2018; Samide & Ritchey, 2021). Specifically, new appraisals generated during affective regulation introduce a new source of information into memory (e.g., a new interpretation or meaning of the event in the big picture, thinking about the silver lining in the experience), which decreases emotion by reshaping the nature of event details (e.g., Holland & Kensinger, 2013). This aligns with visual perspective theories, which propose that people reframe events within the broader meaning of their lives when they shift to an observer-like perspective with a resulting impact on the recall of episodic details and other event characteristics (Libby & Eibach, 2011; Niese et al., 2021). Supporting these ideas, prior research has shown that shifting from an own eyes to an observer-like perspective decreases episodic details during narrative recall, as well as the vividness of visual imagery associated with remembering (e.g., Akhtar et al., 2017; Berntsen & Rubin, 2006; see also Butler et al., 2016). These findings have contributed to the hypothesis that observer-like perspectives emerge due to a loss of visual and/or other episodic detail that supports the emotional aspects of event memories (e.g., for review, see St. Jacques, 2023a). Additionally, functional neuroimaging findings have also shown that regulating emotions through memory interventions, such as shifting to a novel visual perspective, recruits posterior parietal regions, including precuneus and angular gyrus (e.g., Doré et al., 2018; St. Jacques et al., 2017), which are linked to visual imagery and integration of episodic details during AM retrieval (Fletcher et al., 1995; Fulford et al., 2018; Ramanan et al., 2018). Together, these findings point to the critical question of whether changing AM characteristics (e.g., vividness and other episodic details) as a result of recombining event details is a key factor in diminishing emotions via perspective shifts. However, the loss of visual details influences the ability to recombine episodic details in a novel way when shifting from an observer-like perspective to own eyes perspective, thereby mitigating emotional regulation. In other words, shifting from an observer-like to an own eyes perspective does not up-regulate the emotionality of events because the visual information that supports this recollective aspect of event memories is forgotten.

Despite evidence that a shift in visual perspective is an effective emotion regulation strategy (Powers & LaBar, 2019; Wallace-Hadrill & Kamboj, 2016; Webb et al., 2012), many questions remain regarding the relationship between visual perspective and emotion. A critical but understudied question concerns the shifts in visual perspective itself. Previous empirical research has been limited in addressing the mechanisms that underlie this asymmetrical pattern because capturing events in which an observer-like perspective is initially adopted is challenging unless certain types of events are specifically targeted (e.g., giving a public speech; Nigro & Neisser, 1983). Additionally, prior meta-analytical reviews have not directly examined the critical question of how shifts in perspective impact emotionality (Guo, 2022; Moran & Eyal, 2022; Murdoch et al., 2022; Webb et al., 2012), and instead have focused on differences in adopting an own eyes or an observer-like perspective rather than examining the impact of shifting from an initial to an alternative vantage point. Thus, a primary goal of the current meta-analysis was to examine how shifts in perspective influence event memories and the moderating effect of the direction of shift on differences in emotionality.

Factors Determining the Impact of Visual Perspective on Emotion

Although the effect of shifts in visual perspectives on emotion is a robust finding, several factors can influence the strength of the relationship and its direction. Therefore, a meta-analytic approach to investigate this relationship requires scrutinizing these potential moderators. We identified several potential moderators derived from prior studies in the literature, accounting for the sample characteristics, design-related details, measurement of emotion, event characteristics, and variations regarding how visual perspective manipulations were employed.

Sample Characteristics

Prior studies have shown that certain demographic characteristics might be linked to the visual perspective people adopt. For example, Rice and Rubin (2009) found that observer-like perspectives were more prevalent among women than men (but see Siedlecki & Falzarano, 2016), which has been linked to greater feelings of objectification in women (Huebner & Fredrickson, 1999). In line with this, shifting to an observer-like perspective would not be a novel or unusual retrieval process for women, such that it would decrease emotion to a lower degree when compared to men. Prior research has also reported age-related differences due to visual perspective (e.g., Piolino et al., 2006). Thus, we included both the percentage of women/females and mean age as moderators to account for potential variation among the studies.

Design Factors

Repetition during Retrieval/Mental Simulation. Prior studies have asked participants to shift perspective on a single trial (e.g., Akhtar et al., 2017; Faul et al., 2020; Gu & Tse, 2016) or across multiple repetitions (e.g., Crawley, 2010; King et al., 2022; St. Jacques et al., 2017; 2018). Multiple repetitions could boost the potential impact of shifting perspective on emotionality, leading to stronger effect sizes than studies using single repetitions. Thus, the number of repetitions was included as a potential moderator.

Emotional Outcome Measurement

Emotional Intensity and Emotional Valence. Emotional experiences vary in two dimensions: intensity (lower vs. higher arousal) and valence (pleasantness; positive vs. negative; Bradley et al., 1992; 2001). Previous research has suggested that the impact of visual perspectives is more robust on emotional intensity than emotional valence (for review, see Küçüktaş & St. Jacques, 2022). For example, Berntsen and Rubin (2006) found that shifting from an own eyes to an observer-like perspective decreased ratings of the emotional intensity of AMs but had no impact on emotional valence. Thus, we included outcome measures (i.e., valence versus intensity) as a potential moderator.

Event Characteristics

Event Assignment. Studies examining the role of visual perspective shifts on emotion have directly instructed participants to retrieve or simulate emotional events (e.g., Vella & Moulds, 2014) or included instructions allowing participants to self-select events that may range in emotionality (e.g., St. Jacques et al., 2017). The effect size of visual perspective shift on emotion might be larger when emotional events are targeted because there is a greater range with which perspective manipulations could affect emotion. Thus, we included the event assignment as a moderator.

Prior research has reported conflicting findings regarding the relationship between visual perspective and emotional arousal. Although higher emotional arousal is typically linked to adopting an own eyes (D’Argembeau et al., 2003; Talarico et al., 2004), events triggering extreme arousal, such as trauma memories, are often associated with observer-like perspectives (McIsaac & Eich, 2004). Considering this, we also examined whether the initial arousal of the event moderated the effect size. Events that are initially less arousing have less room to decrease than more arousing events; however, it also might be more difficult to reduce the emotionality of events if they are emotionally more arousing.

Visual Perspective Factors

Self-Visibility in Observer-like Perspectives. Self-visibility in an observer-like perspective refers to seeing oneself in the event when visualizing the event from an observer-like perspective. Although the general assumption is that people see themselves in the event when they adopt an observer-like perspective, earlier research showed that self-visibility and an observer-like perspective are independent concepts, such that adopting an observer-like perspective does not guarantee one to see themselves in the event during retrieval or mental simulation (e.g., Kinley et al., 2021). Additionally, an observer-like perspective can emerge at various distances, heights, and locations (Rice & Rubin, 2011), which might impact the visibility of the self. Studies have varied in terms of whether observer-like instructions are associated with self-visibility. Theories propose that emotion would be higher when adopting an observer-like perspective if the self is more salient or visible than non-visible (Sutin & Robins, 2008). Indeed, ensuring the visibility of the self in an observer-like perspective influences the change in emotional aspects of the events, such that higher self-visibility in an observer-like perspective is related to increased emotion (Kinley et al., 2021). Given that prior studies do not typically manipulate the visibility of the self when adopting an observer-like perspective, we instead examined whether emphasizing the visibility of the self when describing observer-like perspectives in the participant instructions (i.e., seeing yourself in the event) would influence the impact of shifting perspective on emotion. Specifically, we predicted that instructions emphasizing self-visibility would attenuate the effect size.

Initial Perspective of Event Memories. Event memories can differ in the dominant or preferred perspective that people adopt (e.g., Rice & Rubin, 2011), and prior studies have differed in whether they control for the dominant perspective of events before manipulating shifts in perspective. Some studies have elicited event memories and then used subjective perspective ratings to categorize them as initially associated with an own eyes or observer-like perspective (e.g., Sekiguchi & Nonaka, 2014; St. Jacques et al., 2017; Vella & Moulds, 2014). Thus, in these studies, the initial perspective reflects the spontaneous or naturally occurring (or dominant) viewpoint of the event memory, and then shifts in perspective reflect a novel viewpoint that differs from the dominant perspective of the event. In other words, when people are asked to shift to the opposite perspective, there would be a more drastic deviation from the naturally occurring perspective of the event, which could lead to greater reconstruction demands and distortion in event characteristics. In contrast, other studies have elicited events by instructing participants to adopt either an own eyes or observer-like perspective during the initial recall (e.g., Gu & Tse, 2016; St. Jacques et al., 2018). In these studies, the initial perspective is “forced” and the characteristics of such events may already be altered (e.g., Berntsen & Rubin, 2006). For example, being forced to retrieve a memory from an own eyes perspective that is typically associated with an observer-like viewpoint would already require a shift in perspective during the initial recall of the event, which may then change the nature of the subsequent manipulation of the perspective shift. We included whether the initial perspective was spontaneous or forced as a potential moderator here, predicting that shifting from a spontaneous perspective would lead to a stronger effect size given that this would involve adopting a more novel viewpoint than shifting from a forced perspective to another forced perspective.

Direction of Perspective Shift. Shifts in perspectives can occur from an own eyes to an observer-like perspective or in the opposite direction. Accordingly, we identified each effect based on the direction of the shift in perspective (i.e., own eyes to observer or observer to own eyes). Given the asymmetrical pattern in the literature (Berntsen & Rubin, 2006; Robinson & Swanson, 1993; Vella & Moulds, 2014), we predicted a larger effect size when shifting from an own eyes to an observer-like perspective compared to the opposite direction.

As reviewed above, mnemonic interventions that modify event characteristics decrease emotionality. To better understand the asymmetrical pattern of shifts in perspective and contributing mechanisms, we aimed to investigate potential changes in other aspects of the events. We focused on vividness in visual imagery for two main reasons. First, shifts in perspective lead to a similar asymmetrical pattern on vividness (for review, see St. Jacques, 2022), and vividness is strongly associated with emotion (e.g., Talarico et al., 2004). Second, many AMs include vividness as a dependent variable, while few studies directly examine the objective content of other types of memory details. Altered vividness, when shifting to a novel observer-like perspective, could be one factor that facilitates reductions in emotion (Doré et al., 2018). However, failure to recover or modify visual details when shifting from an observer-like to an own eyes perspective could be linked to ineffective emotional regulation. Thus, it is of interest to examine how changes in vividness that occur when shifting perspective potentially contribute to the reduction in emotion due to shifting. We predicted that the decrease in emotionality due to shifting from an own eyes to an observer-like perspective would be larger when there are greater decreases in vividness.

The Present Research

The role of visual perspective taking, or more generally self-distancing, on emotion has also been the focus of several previous meta-analyses. However, the scope of these studies involved comparing own eyes and observer-like perspectives (Guo, 2022; Moran & Eyal, 2022; Murdoch et al., 2022) or various emotional regulation strategies (Webb et al., 2012). For example, Moran and Eyal (2022) examined the impact of psychological distance and level of abstraction on emotional experiences based on self-distancing aspects of construal level theory (Trope & Liberman, 2010). They reported a medium effect size (Hedges' g = .52), reflecting reduced emotional experiences due to self-distancing. Similarly, Guo (2022) investigated the impact of self-distancing, specifically visual perspective taking, on emotional experiences elicited by a wide variety of stimuli and found a small effect of visual perspective on emotion (Hedges' g = .26), also suggesting a lower emotionality due to adopting a self-distanced perspective. Murdoch et al. (2022) examined how self-distanced reflections of stressful and adverse life experiences, including lifetime stressors, influenced the emotionality linked to these events. They reported a small effect size (Hedges' g = .19), indicating a reduced emotionality in a self-distanced versus a self-immersed perspective. In contrast, Webb et al. (2012) investigated the effectiveness of components of the process model of emotion regulation (Gross, 1998), of which visual perspective taking was one of the examined strategies. They reported a medium effect size of visual perspective reflecting higher emotion for own eyes than observer (Cohen's d = .45). Thus, prior meta-analyses have found a small to medium effect size when comparing differences in emotionality when adopting an own eyes compared to an observer-like perspective but have not directly examined the role of shifting perspective on event memories.

The present study takes a novel approach to understand *how* and *why* updating the initial perspective of an event by shifting to the opposite perspective decreases emotion. Our approach differs from prior meta-analyses in several important ways. First, we specifically focus on shifts in perspective. That is, here we directly compare emotionality when event memories are initially remembered or imagined versus following an instruction to shift perspective. Thus, we investigate the emotionality of event memories due to shifting perspective and the supporting mechanisms rather than examining differences when adopting an own eyes or observer-like without a requirement to shift perspective. In contrast, prior systematic reviews did not control for the initial viewpoint of event memories and, thus, were limited in investigating the asymmetrical pattern widely demonstrated in the literature. Second, we focus on emotional experiences in event memories, including AMs and episodic mental simulation (i.e., imagining hypothetical scenarios and future events). Prior meta-analyses included a wider range of emotional stimuli, including normative emotional lab materials (Guo, 2022; Moran & Eyal, 2022; Webb et al., 2012) or various emotion regulation strategies (Webb et al., 2012). Our targeted approach allows for a better understanding of the impact of shifting perspective on personally relevant events, which are usually the target of emotional regulation interventions in applied settings. Here we aim to understand the cognitive mechanisms that underlie why the viewpoint people adopt influences emotionality. Specifically, we examine the potential role that visual imagery plays in reshaping memories when people shift perspective (e.g., Butler et al., 2016; Marcotti & St. Jacques, 2018). Overall, the primary goal of the present meta-analysis was to quantify differences in emotionality following a shift in perspectives during the retrieval and simulation of events as well as to characterize the underlying cognitive mechanisms contributing to emotional regulation. Our main prediction was that emotionality would be lower in event memories due to shifting perspective, as reflected by a small to medium effect size. Additionally, consistent with the asymmetrical pattern of shifting (Berntsen & Rubin, 2006; Robinson & Swanson, 1993; see also Butler et al., 2016), we predicted that variability in the effect size would be related to the direction of the shift, such that shifting from an own eyes to an observer-like perspective would reduce emotion, but the reverse shift from observer-like to own eyes perspectives would not impact emotion. Finally, we predicted that the asymmetrical pattern of shifting perspective on emotion would be related to the mnemonic changes in the vividness of event memories.

Methods

Search Strategy. The literature search was conducted in four online scientific databases: PsycINFO, PubMed, EbscoHost, and Web of Science. We used a broad list of search terms representative of visual perspective in event memory and emotion regulation, including: “visual perspective”, “field perspective”, “own eyes perspective”, “egocentric perspective”, “first person perspective”, “1PP”, “observer perspective”, “allocentric perspective”, “third person perspective”, “3PP”, “vantage point”, “cognitive reappraisal”, “self immers*”, “self-distanc*”, “detachment”, “detachment AND emotion”, “detachment AND memory”, “detached perspective”, “out of body”, “mental imagery AND episodic memory”, “mental imagery AND emotion”. The formal literature search included articles published before November 10, 2020.

We conducted an additional more targeted search that identified the articles published after this date and included unpublished data investigating the effects of the shifts in perspective (up to October 1, 2023). The PRISMA flowchart of the literature search and screening process based on Moher et al. (2009) guidelines is depicted in Figure 1. We used Covidence (Covidence, 2022) to manage the systematic review. Studies identified via the database search were imported into Covidence for abstract and title screening, full-text eligibility review, and data extraction phases. SK and a trained research assistant independently conducted abstract and title screening. Conflicts were independently resolved by PLS. SK and two trained research assistants then independently performed the full-text review. Conflicts were resolved by discussion. The inter-rater reliability for screening and eligibility was almost perfect and substantial based on Cohen’s Kappa scores of .857 and .702, respectively (Landis & Koch, 1977).

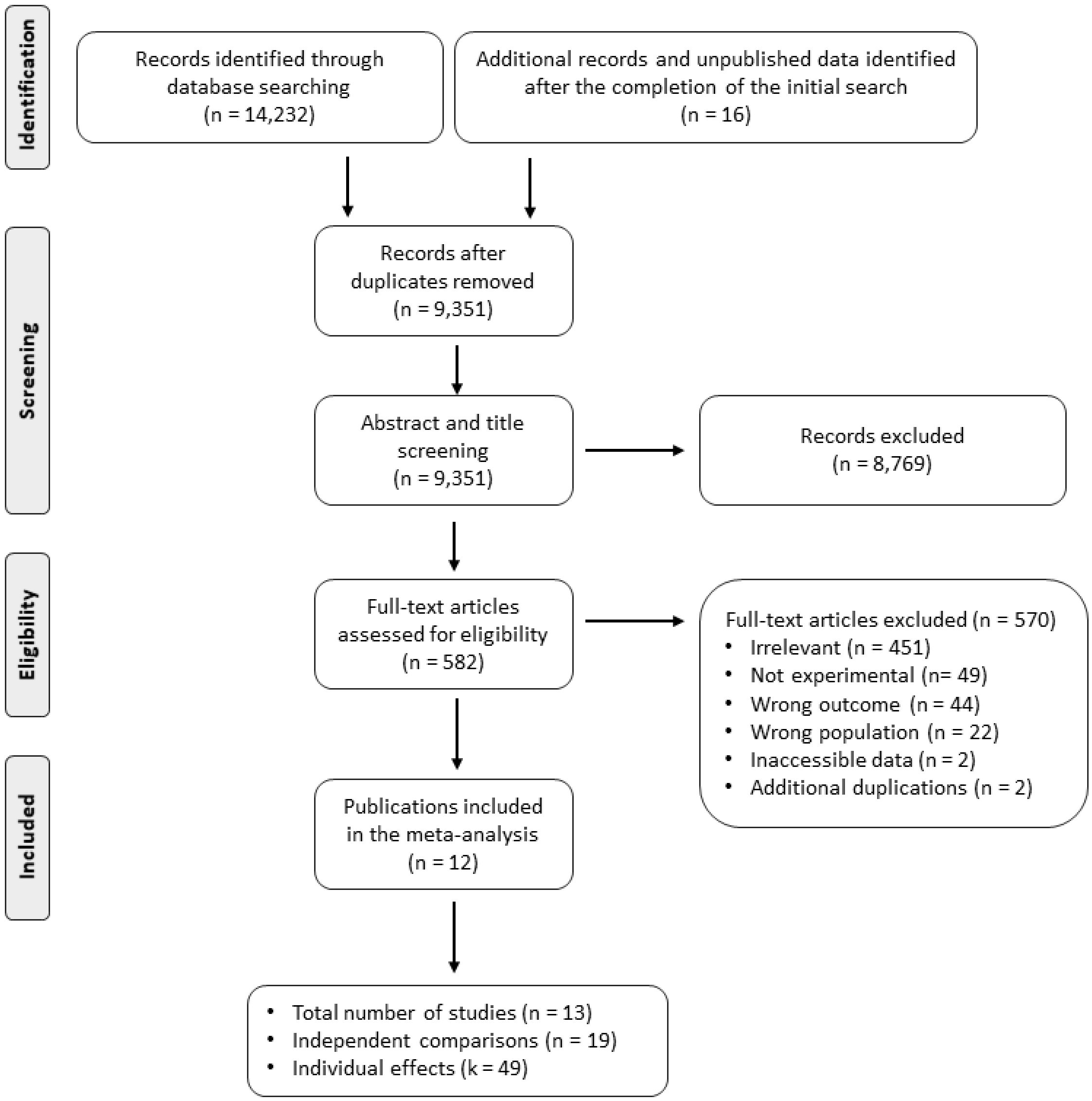

Figure 1. ***PRISMA Flowchart*.** PRISMA flowchart summarizing the screening process and inclusion criteria.

Inclusion/Exclusion Criteria. Studies recruited from databases were restricted to peer-reviewed journal articles published in English and non-clinical adult samples (the most extensive age range in the samples was between 18 to 62). Studies in which participants were recruited based on their scores on an inventory measuring mood-related clinical symptoms were omitted, given that these individuals might perform differently on memory and emotion regulation tasks (see also Webb et al., 2012). We also included unpublished studies involving shifts in perspectives based on research in our lab and by searching archives of published data for studies.

The current meta-analysis focused on the influence of shifts in perspective in event memory (Rubin & Umanath, 2015). Thus, selected studies were restricted to empirical investigation of AM and imagination of future events and other imagined scenarios. The included studies had to manipulate own eyes and observer-like perspectives by shifting. That is, we included studies that measured the initial perspective of remembered or imagined events (Initial condition) and then explicitly instructed participants to shift perspective (Shifted condition). Studies in which emotional states were triggered by normative lab materials (e.g., arousing visual images or videos) were excluded (e.g., Basso et al., 2018; Ochsner et al., 2004). Own eyes perspectives could include manipulations asking participants to visualize the event from the viewpoint where they were located in the event (e.g., Crawley et al., 2010; Vella & Moulds, 2014), as well as studies in which own eyes perspectives were manipulated by 1st person pronoun use during narrative recall (e.g., Gu & Tse, 2016). Likewise, observer-like perspective manipulations could include instructions asking participants to visualize the event from an observer's viewpoint (e.g., King et al., 2022; Sekiguchi & Nonaka, 2014) or studies in which observer-like perspectives were manipulated by 3rd person pronoun use (e.g., Gu & Tse, 2016). However, we excluded studies with a distancing manipulation not directly targeting visual perspective (i.e., temporal or hypothetical; Trope & Liberman, 2010) or involving instructions that did not require participants to adopt a specific visual perspective. All included studies had to measure emotion for both the initial and shifted perspective conditions. Studies were included if they measured emotion using subjective ratings or objective measures such as emotion/thought contents in event narratives. However, we excluded studies that only used a single measurement of emotional valence with endpoints from negative to positive, given difficulties in interpreting increases and decreases in emotionality. Finally, we excluded studies in which the effect size calculation could not be determined. We contacted the corresponding author with a data request for studies in which the required information was missing in the reported article. After these additional steps, we excluded the study if the data was still inaccessible.

Coding Procedures. We developed a coding protocol to extract information related to study characteristics and moderators in the full-text review. SK and two trained research assistants performed the coding. To assess inter-rater reliability, we performed an intra-class correlation for the continuous variables and calculated kappa for the categorical variables. The average intra-class correlation coefficient was .887, indicating good reliability (Koo & Li, 2016), and the kappa statistics were moderate, with a mean of .534 (Landis & Koch, 1977). Disagreements or conflicts were resolved by discussion. The coding of the main study characteristics is presented in Table 1.

Table 1

Characteristics and Effect Sizes for Studies Included in the Meta-analysis

	Moderators										Descriptive Statistics						Effect Sizes				
											Shifted Perspective			Initial Perspective				95% CI			
References	% Women/Females	Age	Repetition	Measurement	Event Assignment	Initial Arousal*	Self Visiblity in Observer	Initial Perspective	Direction of Shift**	Change in Vividness*	N	Mean	SD	N	Mean	SD	Hedges' *g*	LL	UL	Variance	*Z*
Akhtar et al. (2017) a	94.29	21.5	Single	Intensity	Self-selected	-0.88	Visible	Spontaneous	OE to OB	-	33	2.65	1.01	33	3.66	1.08	-0.95	0.45	1.46	0.07	2.33
Akhtar et al. (2017) b	94.29	21.5	Single	-	Self-selected	-0.88	Visible	Spontaneous	OE to OB	-	33	0.62	0.98	33	0.84	1.09	-0.21	-0.27	0.69	0.06	-0.12
Akhtar et al. (2017) c	94.29	21.5	Single	Intensity	Self-selected	-1.63	Visible	Spontaneous	OB to OE	-0.92	33	2.9	1.2	33	2.9	1.2	0.00	-0.48	0.48	0.06	-0.81
Akhtar et al. (2017) d	94.29	21.5	Single	-	Self-selected	-1.63	Visible	Spontaneous	OB to OE	-0.92	33	0.61	0.93	33	0.4	0.93	0.22	-0.71	0.26	0.06	-1.54
Crawley et al. (2010) S2 a	81.11	29.2	Multiple	Valence	Emotional	1.60	Visible	Spontaneous	OE to OB	-	30	5.8	1.5	30	6.2	1.1	-0.30	-0.21	0.81	0.07	0.18
Crawley et al. (2010) S2 b	81.11	29.2	Multiple	Intensity	Emotional	1.60	Visible	Spontaneous	OE to OB	-	30	5.7	1.7	30	5.7	1.8	0.00	-0.51	0.51	0.07	-0.81
Crawley et al. (2010) S2 c	81.11	29.2	Multiple	-	Emotional	1.60	Visible	Spontaneous	OE to OB	-	30	5.4	1.7	30	5.6	1.2	-0.13	-0.37	0.64	0.07	-0.37
Crawley et al. (2010) S2 d	81.11	29.2	Multiple	-	Emotional	1.60	Visible	Spontaneous	OE to OB	-	30	3.1	1.5	30	3.1	1.5	0.00	-0.51	0.51	0.07	-0.81
Crawley et al. (2010) S2 e	81.11	29.2	Multiple	Valence	Emotional	-0.75	Visible	Spontaneous	OE to OB	-	30	4.2	2	30	3.8	1.5	0.22	-0.73	0.28	0.07	-1.54
Crawley et al. (2010) S2 f	81.11	29.2	Multiple	Intensity	Emotional	-0.75	Visible	Spontaneous	OE to OB	-	30	3.8	1.9	30	4.2	1.4	-0.24	-0.27	0.74	0.07	-0.03
Crawley et al. (2010) S2 g	81.11	29.2	Multiple	-	Emotional	-0.75	Visible	Spontaneous	OE to OB	-	30	2.9	2.1	30	3.1	1.5	-0.11	-0.4	0.61	0.07	-0.45
Crawley et al. (2010) S2 h	81.11	29.2	Multiple	-	Emotional	-0.75	Visible	Spontaneous	OE to OB	-	30	2.1	1.1	30	2.1	1.6	0.00	-0.51	0.51	0.07	-0.81
Faul et al. (2020)	51.72	23.7	Single	Intensity	Emotional	-0.92	Visible	Spontaneous	OE to OB	0.87	28	3.36	0.84	28	3.62	0.89	-0.30	-0.23	0.82	0.07	0.17
Gu et al. (2016) a	53.92	19.84	Single	Intensity	Emotional	0.49	Not Visible	Forced	OE to OB	-1.00	56	4.14	1.51	56	5.07	1.25	-0.67	0.29	1.05	0.04	1.39
Gu et al. (2016) b	53.92	19.84	Single	Intensity	Emotional	0.29	Not Visible	Forced	OE to OB	-0.18	56	3.89	1.53	56	4.86	1.54	-0.63	0.25	1.01	0.04	1.26
Gu et al. (2016) d	53.92	19.84	Single	Intensity	Emotional	0.42	Not Visible	Forced	OB to OE	0.46	46	4.76	1.48	46	5	1.43	-0.16	-0.25	0.57	0.04	-0.27
Gu et al. (2016) e	53.92	19.84	Single	Intensity	Emotional	0.26	Not Visible	Forced	OB to OE	-0.44	46	4.83	1.66	46	4.83	1.54	0.00	-0.41	0.41	0.04	-0.81
King et al. (2022) a	62.5	23.33	Multiple	Intensity	Self-selected	-0.87	Visible	Spontaneous	OE to OB	-	39	3.27	0.9	39	3.67	0.81	-0.46	0.01	0.91	0.05	0.72
King et al. (2022) b	62.5	23.33	Multiple	-	Self-selected	-0.87	Visible	Spontaneous	OE to OB	-	39	1	0.89	39	1.45	0.8	-0.53	0.08	0.98	0.05	0.93
Küçüktaş et al. (2023d) S2 a	64.98	19.1	Multiple	Intensity	Emotional	0.68	Visible	Forced	OE to OB	1.02	111	5.6	1.48	111	5.26	1.74	0.21	-0.47	0.05	0.02	-1.50
Küçüktaş et al. (2023d) S2 b	64.98	19.1	Multiple	Valence	Emotional	0.68	Visible	Forced	OE to OB	1.02	111	5.6	1.48	111	5.73	1.46	-0.09	-0.18	0.35	0.02	-0.52
Küçüktaş et al. (2023d) S2 c	64.98	19.1	Multiple	Intensity	Emotional	0.42	Visible	Forced	OE to OB	1.08	111	4.93	1.63	111	4.99	1.48	-0.04	-0.22	0.3	0.02	-0.68
Küçüktaş et al. (2023d) S2 d	64.98	19.1	Multiple	Valence	Emotional	0.42	Visible	Forced	OE to OB	1.08	111	5.52	1.33	111	5.61	1.17	-0.07	-0.19	0.33	0.02	-0.57
Küçüktaş et al. (2023d) S2 e	64.98	19.1	Multiple	Intensity	Emotional	0.51	Not Visible	Forced	OE to OB	0.72	109	4.55	1.58	109	5.09	1.47	-0.35	0.09	0.62	0.02	0.35
Küçüktaş et al. (2023d) S2 f	64.98	19.1	Multiple	Valence	Emotional	0.51	Not Visible	Forced	OE to OB	0.72	109	5.21	1.47	109	5.62	1.48	-0.28	0.01	0.54	0.02	0.10
Küçüktaş et al. (2023d) S2 g	64.98	19.1	Multiple	Intensity	Emotional	0.42	Not Visible	Forced	OE to OB	0.46	109	4.43	1.65	109	4.99	1.58	-0.35	0.08	0.61	0.02	0.33
Küçüktaş et al. (2023d) S2 h	64.98	19.1	Multiple	Valence	Emotional	0.42	Not Visible	Forced	OE to OB	0.46	109	5.07	1.35	109	5.44	1.35	-0.27	0.01	0.54	0.02	0.09
Küçüktaş et al. (2023d) S3 a	46.96	24.4	Multiple	Intensity	Emotional	0.82	Visible	Forced	OE to OB	1.13	48	5.23	1.42	48	5.4	1.57	-0.11	-0.29	0.51	0.04	-0.44
Küçüktaş et al. (2023d) S3 b	46.96	24.4	Multiple	Valence	Emotional	0.82	Visible	Forced	OE to OB	1.13	48	5.83	1.23	48	6.15	1.15	-0.27	-0.14	0.67	0.04	0.07
Küçüktaş et al. (2023d) S3 c	46.96	24.4	Multiple	Intensity	Emotional	0.37	Visible	Forced	OE to OB	1.05	48	5.08	1.4	48	4.94	1.54	0.09	-0.49	0.31	0.04	-1.12
Küçüktaş et al. (2023d) S3 d	46.96	24.4	Multiple	Valence	Emotional	0.37	Visible	Forced	OE to OB	1.05	48	5.35	1.38	48	5.33	1.65	0.01	-0.41	0.39	0.04	-0.85
Küçüktaş et al. (2023d) S3 e	46.96	24.4	Multiple	Intensity	Emotional	1.12	Not Visible	Forced	OE to OB	-0.01	53	4.98	1.56	52	5.71	1.51	-0.47	0.08	0.86	0.04	0.75
Küçüktaş et al. (2023d) S3 f	46.96	24.4	Multiple	Valence	Emotional	1.12	Not Visible	Forced	OE to OB	-0.01	53	5.57	1.43	53	6.26	1.25	-0.51	0.12	0.9	0.04	0.87
Küçüktaş et al. (2023d) S3 g	46.96	24.4	Multiple	Intensity	Emotional	0.50	Not Visible	Forced	OE to OB	-0.01	53	4.19	1.72	53	5.08	1.63	-0.53	0.14	0.91	0.04	0.93
Küçüktaş et al. (2023d) S3 h	46.96	24.4	Multiple	Valence	Emotional	0.50	Not Visible	Forced	OE to OB	-0.01	53	4.89	1.56	53	5.68	1.53	-0.51	0.12	0.89	0.04	0.86
Sekiguchi et al. (2014) b	-	-	Single	Intensity	Emotional	-0.60	Visible	Spontaneous	OB to OE	0.03	24	3.22	0.78	24	3.65	0.65	-0.59	0.01	1.17	0.09	1.13
St. Jacques (2023b) a	65.35	21.4	Single	Intensity	-	0.65	Visible	Spontaneous	OE to OB	-0.76	88	44.9	31.71	88	52.28	34.43	-0.22	-0.07	0.52	0.02	-0.08
St. Jacques (2023b) b	65.35	21.4	Single	Intensity	-	0.07	Visible	Spontaneous	OB to OE	0.19	88	46.03	28.94	88	46.39	31.44	-0.01	-0.28	0.31	0.02	-0.77
St. Jacques (2023c) a	60.53	19.0	Single	Intensity	-	1.21	Visible	Spontaneous	OE to OB	-0.35	73	47.72	34.04	73	58	31.95	-0.31	-0.02	0.64	0.03	0.21
St. Jacques (2023c) b	60.53	19.0	Single	Intensity	-	0.38	Visible	Spontaneous	OB to OE	0.75	73	44.68	28.86	73	49.58	30.83	-0.16	-0.16	0.49	0.03	-0.27
St. Jacques et al. (2017)	68.97	22.6	Multiple	Intensity	Self-selected	-1.63	Visible	Spontaneous	OE to OB	-	29	2.66	0.7	29	2.9	0.69	-0.34	-0.18	0.86	0.07	0.31
St. Jacques et al. (2018) a	55.17	21.3	Multiple	Intensity	Self-selected	-1.58	Visible	Forced	OE to OB	-	29	2.94	0.65	29	2.95	0.59	-0.02	-0.5	0.53	0.07	-0.76
St. Jacques et al. (2018) b	55.17	21.3	Multiple	Intensity	Self-selected	-1.70	Visible	Forced	OB to OE	-	29	2.94	0.62	29	2.82	0.67	0.18	-0.7	0.33	0.07	-1.41
St. Jacques et al. (2018) c	55.17	21.3	Multiple	Intensity	Self-selected	-1.77	Visible	Forced	OE to OB	-	29	2.73	0.59	29	2.75	0.59	-0.03	-0.48	0.55	0.07	-0.70
St. Jacques et al. (2018) d	55.17	21.3	Multiple	Intensity	Self-selected	-1.78	Visible	Forced	OB to OE	-	29	2.79	0.49	29	2.74	0.64	0.09	-0.6	0.43	0.07	-1.09
Vella et al. (2014) a	66.25	20.35	Single	Valence	Emotional	-	Not Visible	Spontaneous	OE to OB	-1.39	42	70.95	19.07	42	81.76	13.07	-0.66	0.22	1.09	0.05	1.35
Vella et al. (2014) b	66.25	20.35	Single	Valence	Emotional	-	Not Visible	Spontaneous	OB to OE	-0.30	32	82.19	20.32	32	86.38	12.32	-0.25	-0.25	0.74	0.06	0.00
Vella et al. (2014) c	66.25	20.35	Single	Valence	Emotional	-	Not Visible	Spontaneous	OE to OB	-0.71	35	74	16.17	35	81.97	14.43	-0.51	0.04	0.99	0.06	0.89
Vella et al. (2014) d	66.25	20.35	Single	Valence	Emotional	-	Not Visible	Spontaneous	OB to OE	-0.83	36	77.92	16.96	36	81.53	15.3	-0.22	-0.24	0.68	0.06	-0.08

*Standardized scores

**Direction of Shift categories: OE to OB stands for shifts from Own Eyes to Observer-like perspective. OB to OE stands for shifts from Observer-like to Own Eyes perspective.

Our coding protocol comprised data extraction related to publication details, general study and sample characteristics, and moderator categories. The coding protocol for the publication details applied to author names, publication year, and publication status. General study characteristics include the country where the data was collected and the study design (all articles included were experimental designs). The coding of moderators is described in Table 2.

Table 2
The List of Moderators

Moderators	Categories
Sample Characteristics	
Mean Percentage of Females	*Continuous moderator*
Mean Age of the Sample	*Continuous moderator*
Design Factors	
Repetition of Shift in Perspective	Single Multiple
Measurement and Outcome Factors	
Measurement of Emotion	Emotional Intensity Emotional Valence
Event Characteristics	
Event Assignment	Emotional Event Self-Selected Event
Initial Emotional Arousal	*Continuous moderator*
Visual Perspective Factors	
Self Visibility in Observer-like Perspective	Visible Not Visible
Initial Perspective of Events	Spontaneous Forced
Direction of Perspective Shift	Own eyes to Observer Observer to Own Eyes

Note. The list includes both continuous and categorical moderators. Specific categories within each categorical moderator as well as continuous moderators are indicated in the corresponding lines.

Effect Size Calculation. The dependent variable emotionality was based on emotional responses measured from low to high, such that lower scores indicated less emotionality (e.g., decrease in arousal, positive valence, negative valence, emotional words in narratives) and higher scores reflected an increase in the relevant emotional experience.

To calculate effect sizes, we coded the mean and SDs of measured emotionality in the initial and shifted perspective conditions and the sample sizes in each condition. We first manually calculated the effects sizes in Cohen's *d* for within- and between-subject designs (Lakens, 2013). However, given that we included a few individual effects with smaller samples than other studies that might bias the estimate of Cohen's *d* ($n < 25$; Sekiguchi & Nonaka, 2014), we used Hedges' *g* to calculate the overall effect size to correct for potentially biased estimations (Borenstein et al., 2009; Hedges & Olkin, 1985; Lakens, 2013). Effect sizes were calculated based on the standardized mean difference (Borenstein et al., 2009) by subtracting the mean emotionality in the shifted from the initial perspective conditions. Thus, negative values indicate lower emotionality in the shifted than initial perspective condition, whereas positive values indicate higher emotionality in the shifted than initial perspective condition. We predicted that the effect size would be negative, reflecting a reduction in emotionality following a shift in perspective.

For studies in which a specific emotion or valence was targeted, but the authors reported more than one type of emotion or valence rating, we calculated the effect size only for the targeted emotion or valence elicited in the event. For example, Crawley (2010) asked participants to retrieve negative memories but reported the change in positive and negative valence due to shifting. In this case, we calculated the effect size of negative valence ratings but disregarded positive valence ratings given that the targeted events were negative. Finally, some studies did not target a specific category of emotion or emotional valence (e.g., King et al., 2022; St. Jacques et al., 2017), or participants were asked to recall events that might contain multiple emotions (e.g., giving a public presentation; St. Jacques, 2023b). In those instances, we calculated the effect size for each measurement of emotion reported (see also Webb et al., 2012).

Meta-analytic Procedures. A substantial number of studies reported multiple effect sizes, leading to dependent effects (Borenstein et al., 2009). For example, some studies reported both emotional intensity and valence ratings (e.g., Crawley, 2010; Küçüktaş & St. Jacques, *unpublished*). To deal with the dependent nature of the data, we followed a multilevel model approach rather than averaging the dependent effect sizes (Assink & Wibbelink, 2016; Moeyaert et al., 2017). That is, individual effect sizes obtained from the same samples were nested within the dependent comparisons investigated in the same studies and reported in the same articles. These clustering variables (i.e., individual effects, [in]dependent comparisons, studies, and articles) were included as random effects in the model.

Outlier Detection and Sensitivity Analyses. To detect possible outliers among the included effect sizes, we first calculated the z-scores for each effect size. With a conservative approach, effect sizes with z-scores larger than +2.50 or smaller than -2.50 were treated as significant outliers and excluded from the meta-analysis. We excluded one individual effect as a significant outlier. We also conducted Cook's distance and leave-one-out analyses[1] to detect potential influential cases (Borenstein et al., 2009). Cook's distance analysis revealed two potentially influential effects on the 0.04 cut-off score. However, leave-one-out analysis showed that removing any of the included studies did not substantially change the effect size (ranging from -.207 to -.233), and the overall effect remained significant. Thus, the final sample

[1] Leave-one-out analysis was conducted by treating the data as it had a unilevel structure due to the incompatibility of the function with multilevel models.

size includes 49 individual effects from 19 independent comparisons, reported in 13 studies in 12 articles.

Publication Bias. Publication bias was examined in two ways. First, we created a funnel plot to examine publication bias and then conducted an Egger's regression test to investigate funnel plot asymmetry (Egger et al., 1997). Second, we calculated Rosenthal's fail-safe N (Rosenthal, 1979) to examine whether the inclusion of significant results caused a publication bias.

Moderator Analyses. Moderator analyses were conducted separately for each individual moderator. For continuous moderators (i.e., percentage of female participants, mean age of the sample, initial emotional arousal), we first calculated the z-score of each data point. Data points in which the z-scores are larger than +2.50 or smaller than -2.50 were treated as significant outliers and excluded and reported in the relevant moderator analyses. Then, we investigated the significance of the overall moderation effect. For categorical moderators (i.e., repetition during retrieval/mental simulation, measurement of emotion, event assignment, self-visibility in an observer-like perspective, the initial perspective of the event, and the direction of perspective shift), we first examined the significance of the overall moderation model. If the overall moderation was significant, then we conducted follow-up analyses at each level of the moderator to determine whether the effect significantly differed across each level of the moderator.

Transparency and Openness. We adhered to the PRISMA 2020 (Page et al., 2021) and MARS (Appelbaum et al., 2018) guidelines for systematic reviews. We reported all data exclusions, manipulations, and measures in the study. All meta-analytic data, analysis code, and research materials (including our coding scheme) are available at osf.io/veyk6.

Data were analyzed using R, version 4.2.1 (R Core Team, 2020) and the package metafor (Viechtbauer, 2010). The analysis script was adapted from prior research (Moran & Eyal, 2022). This review project was not preregistered.

Results

Overall Effect Size and Publication Bias Analyses

Supporting our prediction, we found a significant overall effect of shifting perspective on emotion (k = 49, Hedges' g = -.255, 95% CI [-.359, -.151], Z = -4.83, p < .001), revealing a small effect size in which shifted perspective reduced emotionality compared to the initial perspective (see Figure 2A). Thus, shifting from one perspective to an alternative perspective (i.e., across perspectives) was associated with less emotionality of event memories. The results of Egger's test showed no publication bias, Z = -.32, p = .750 (see Figure 2B). Similarly, the results from Rosenthal's fail-safe N test showed that 992 additional effects would be required to change the overall effect, indicating that our dataset is unlikely to have publication bias[2]. However, heterogeneity within the overall effect size, $Q(48) = 74.157$, p = .009, $I^2 = 43.841\%$, with $\tau^2 = 0.00$, warranted conducting moderator analyses.

[2] To further assess publication bias, we additionally aggregated the effects sizes recruited from dependent comparisons. Egger's test revealed no funnel plot asymmetry (Z = -1.39, p = .164) and Rosenthal's fail-safe N test also showed that 275 more effects would be required to change the overall effect.

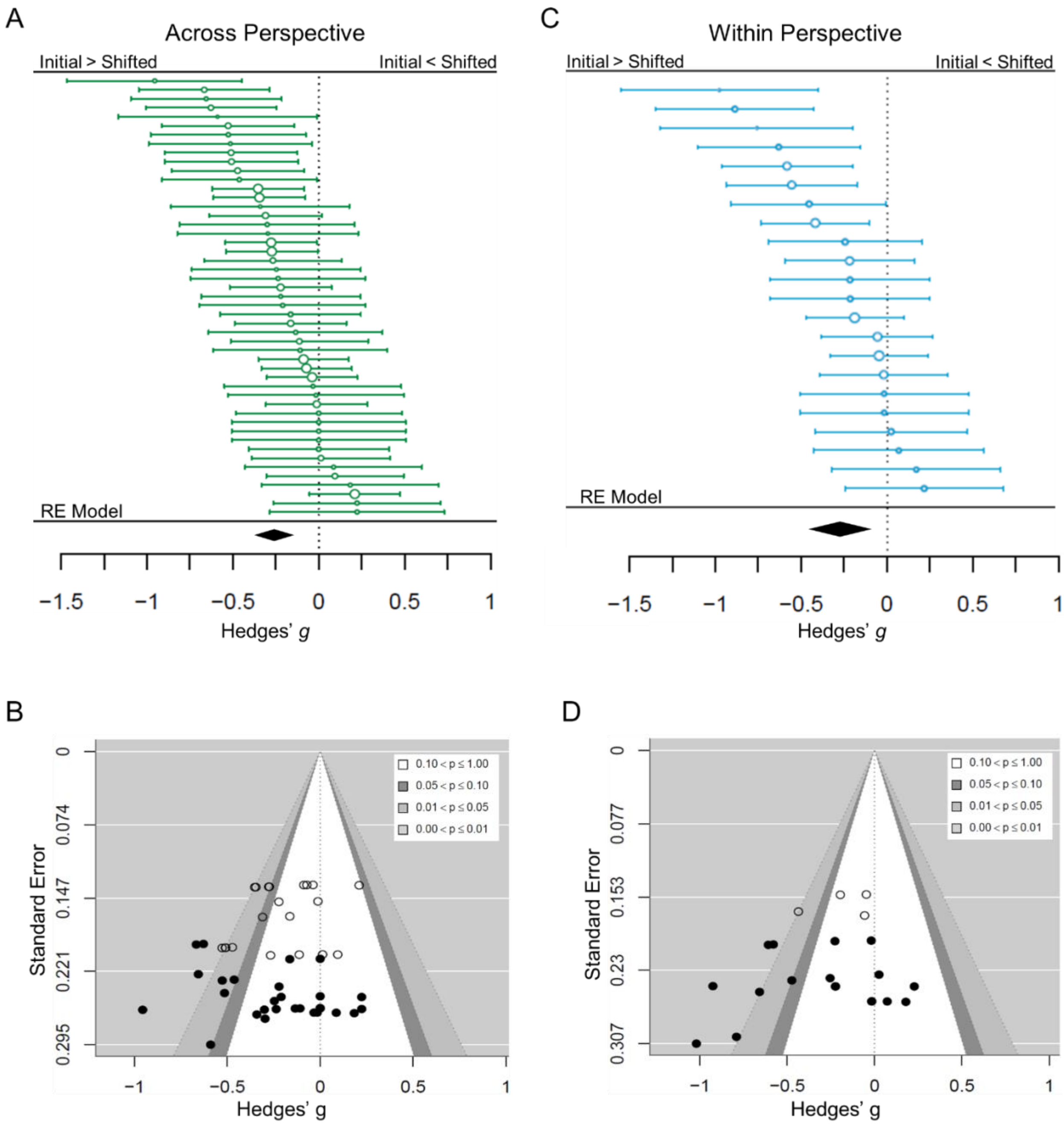

Figure 2**. Caterpillar Plots of the Included Effects and Publication Bias Analyses. Caterpillar plots display the overall effect on emotion in (A) across perspective (main meta-analysis) and (C) within perspective comparisons (secondary meta-analysis). Each dot represents an individual effect size, surrounded by 95% CIs. Effects on the left side of the graphs depict lower emotionality in the shifted than initial perspectives, whereas effects on the right side depict greater emotionality in the shifted than initial perspectives. Black diamonds on the X-axes represent the overall effect on emotion in Hedges' *g*. Color-enhanced funnel plots display the individual effects in the effect level in (B) across perspective (main meta-analysis) and (D) within perspective comparisons (secondary meta-analysis). Solid circles depict the effects of published

studies, and hollow circles depict the effects of unpublished studies. The X-axes indicates the magnitude of the effects in Hedges' *g*, and the Y-axes indicates the standard error of the effect sizes.

Moderator Analyses

We conducted separate moderator analyses for all the categories highlighted in the coding protocol[3]. Statistics of the moderators, including the number of individual effects in each category, average effect sizes, and their significance, are reported below. We checked whether there were significant outliers in continuous moderators. Unless otherwise stated, we found no significant outliers. Statistics of the significant categorical moderators are highlighted in Table 3.

Sample Characteristics

None of the sample characteristics were significant moderators. Neither the percentage of female participants, (k = 48), Q(1) = .306, β = .002, Z = -.553, 95% CI [-.006, .011], p = .579, nor the mean age of participants, (k = 48), Q(1) = .170, β = .008, Z = .412, 95% CI [-.030, .047], p = .680,[4] were significant.

Design Factors

Repetition during Retrieval/Mental Simulation. We identified whether participants were instructed to shift perspective on a single repetition (k = 18) or multiple repetitions (k = 31). However, there were no significant differences in the effect size due to the number of repetitions of the shift in perspective, Q(1) = 1.275, β = -.119, Z = -1.129, 95% CI [-.326, .087], p = .258.

[3] We also ran a combined model in which all moderators were examined together. The results revealed similar findings with the separate analyses. However, to prevent data and power loss due to missing data or removing significant outliers in specific moderators in a combined model, we reported the moderator analyses separately.
[4] One outlier was removed

Emotional Outcome Measurement

We conducted moderator analyses to examine whether differences in how emotion was measured influenced the effect size. However, there was no significant difference in the effect size based on whether emotion was measured with emotional intensity (k = 28) or emotional valence (k = 14) as the outcome, $Q(1) = .396$, $\beta = -.042$, $Z = -.629$, 95% CI [-.176, .090], $p = .528$.

Event Characteristics

Event Assignment. We examined whether events were elicited with instructions to recall an emotional event ($k = 34$) or were self-selected events ($k = 11$) moderated the effect of shifting perspective on emotion. There was no significant difference based on the event assignment, $Q(1) = .173$, $\beta = .061$, $Z = .416$, 95% CI [-.226, .348], $p = .676$.

We also examined whether the initial arousal of the event moderated the effect size. After coding the initial arousal for each effect, we standardized the scores because there was variability in how this was measured across the studies. However, the initial arousal of the event ($k = 45$) was not a significant moderator, Q(1) = 1.031, $\beta = -.050$, $Z = -1.015$, 95% CI [-.147, .046], $p = .309$.

Visual Perspective Factors

Self-Visibility in Observer-like Perspective. We identified whether the instructions in the observer-like perspective conditions influenced self-visibility by asking participants to visualize themselves in the event ($k = 33$) or not ($k = 16$). The results indicated that self-visibility in observer-like perspectives was a significant moderator, $Q(1) = 8.765$, $\beta = .251$, $Z = 2.960$, 95% CI [.085, .418], $p = .003$. Specifically, shifting reduced emotion in both cases; however, the reduction was significantly smaller when there was an emphasis on self-visibility (see Figure 3A and Table 3).

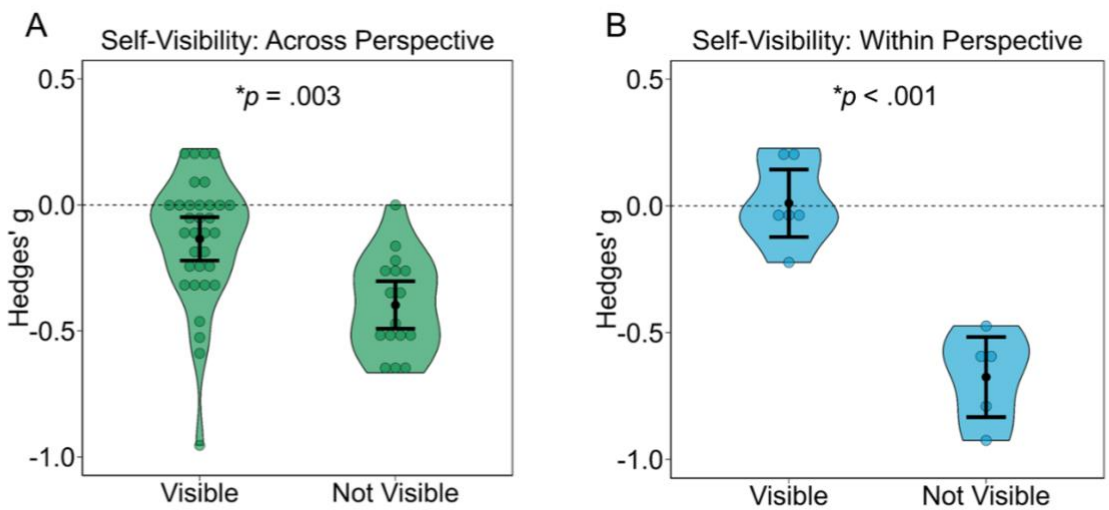

Figure 3. *Self-Visibility in Observer-like Perspectives***.** Results of moderator analyses for the self-visibility in the observer-like perspectives in the (A) across and (B) within perspective meta-analyses. Each data point represents an individual effect size. Black dots depict the aggregated effect size in each moderator category, and the error bars display the 95% CIs of the mean. *p*-value indicates the significance of the overall moderation model.

Initial Perspective of Events. We examined whether instructions eliciting the initial perspective of the events influenced the effect size by comparing spontaneous (k = 25) and forced (k = 24) perspectives. There were no significant differences based on how the initial perspective of events was elicited, $Q(1) = .429$, $\beta = -.071$, $Z = -.655$, 95% CI [-.286, .142], $p = .512$.

Direction of Perspective Shift. We examined whether shifting from an own eyes to an observer-like perspective (k = 38) or from an observer-like to an own eyes perspective (k = 11) influenced the effect size. The results indicated that there was a significant difference in the effect size depending upon the direction of the perspective shift, $Q(1) = 7.049$, $\beta = -.246$, Z = -

2.655, 95% CI [-.429, -.064], p = .007, such that there was a greater reduction in emotionality when shifting from an own eyes to an observer-like perspective compared to shifting in the reverse direction, which did not differ from zero (see Figure 4 and Table 3). Thus, as predicted, the direction of the shift in perspective influenced the impact on the emotionality of event memories.

To better understand why the asymmetrical pattern occurs, we examined whether changes in the vividness of events interacted with the effects of shifting perspective on emotion. We extracted average vividness ratings for Initial and Shifted conditions reported in the publication or based on data shared with the publication. Then, to determine changes in vividness, we calculated the difference in vividness by subtracting vividness in the initial perspectives from the shifted perspectives (Shifted – Initial). Thus, negative values reflect lower vividness in the shifted compared to initial perspectives (i.e., decrease in vividness due to shifting), whereas positive values reflect higher vividness in the shifted, compared to initial perspectives (i.e., vividness increases due to shifting). There was variability in how vividness was measured across the studies; therefore, we standardized the ratings. We also excluded two significant outliers in which z-scores were larger than 2.50. The overall interaction model was significant, Q(3) = 14.797, p = .002. There was no significant main effect of the change in vividness (k = 32), β = -.119, Z = -.904, 95% CI [-.376, .138], p = .365. However, there was a significant main effect of the direction of shift, β = -.202, Z = -2.18, 95% CI [-.385, -.020], p = .028, which qualified by a significant interaction between the change in vividness and the direction of perspective shift, β = .332, Z = 2.212, 95% CI [.038, .627], p = .026. Follow-up analyses indicated that there was a significant and positive relationship between change in vividness and the overall effect on emotion when shifting from an own eyes to an observer-like perspective, β = .359, Z = 4.405, 95% CI [.199, .520], p < .001, but not when shifting from an observer-like to an own eyes perspective, β = -.064, Z = -.393, 95% CI [-.383, .255], p = .693 (see Figure 4B). Specifically, greater decreases in the vividness of visual imagery when shifting from an own eyes to an observer-like perspective (negative values on the x-axis in Figure 4B) predicted a larger effect size on emotionality (i.e., a larger reduction in emotion due to shifting perspectives; see Figure 4B). Thus, these findings support our prediction that the asymmetrical pattern of shifting perspective on emotion can be explained by differences in the vividness of event memories that arise when people shift from an own eyes to an observer-like perspective but not when they shift from an observer-like to an own eyes perspective.

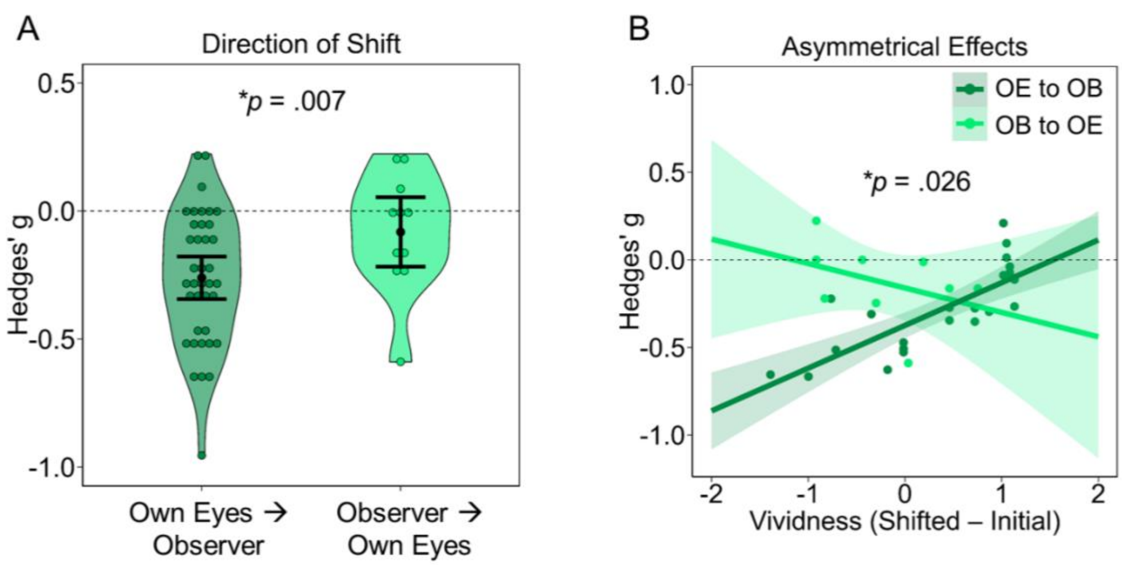

Figure 4. *Direction of Shift and Asymmetrical Effects*. (A) Results of moderator analyses for the direction of shift. Black dots depict the aggregated effect size in each moderator category, and the error bars display the 95% CIs of the mean. p-value indicates the significance of the overall moderation model. Own Eyes to Observer: Shift from Own Eyes to Observer-like perspective. Observer to Own Eyes: Shift from Observer-like to Own Eyes perspective. (B) A scatterplot depicting asymmetrical effects by the interaction between the difference in vividness and the direction of shift. Each data point represents an individual effect size. Shaded areas represent

95%CIs. The x-axis shows the difference in vividness between the shifted and initial perspectives (Shifted – Initial), such that negative values reflect a decrease in vividness due to shifting perspective. The y-axis shows the Hedges' *g* as the effect size, such that negative values reflect a reduction in emotionality in the shifted versus initial perspective.

Table 3
Follow-Up Analyses Examining the Significance of Each Level for the Categorical Moderators

			Difference from zero			
Moderators	*k*	Hedges' *g*	β	*Z*	95% CI	*p*
Main Meta-Analysis						
Self Visibility in Observer**						
Visible	33	-.14	-.14	-2.76	[-.25, -.04]	< .001
Not Visible	16	-.40	-.40	-5.93	[-.53, -.27]	.005
Direction of Perspective Shift*						
Own Eyes to Observer	38	-.26	-.33	-5.13	[-.45, -.20]	< .001
Observer to Own Eyes	11	-.08	-.08	-.92	[-.25, .09]	.358
Secondary Meta-Analysis						
Event Assignment*						
Emotional Event	10	-.49	-.47	-3.93	[-.71, -.24]	< .001
Self-Selected Event	8	-.08	-.08	-.60	[-.36, .19]	.550
Self Visibility in Observer**						
Visible	6	.01	-.01	-.13	[-.18, .16]	.896
Not Visible	5	-.68	-.65	-6.31	[-.86, -.45]	< .001

Note. The table depicts the statistics examining whether the effect size for each level of the significant categorical moderators is significantly different from zero. The asterisk denotes the significance of the overall moderation model: * $p < .05$; ** $p < .01$. *k* = number of individual effects in the relevant moderator category; Hedges' *g* = the aggregated effect size in the moderator categories reflecting the difference in the Shifted versus Initial conditions; β = the estimated effect size in the multilevel model; *Z* = z-score of the estimated effect size; 95% CI and *p* values the significance of the moderator categories.

Within Perspective Effects

Our main meta-analysis focused on the differences in emotionality when people shift *across* alternative perspectives (i.e., from own eyes to observer, or vice versa). However, an equally important question is how shifting perspective impacts emotionality when people shift *within* own eyes or observer-like perspectives. That is, emotionality can differ within a particular event depending on whether the resulting vantage point occurs due to a shift in perspective. For example, if shifts in perspective reduce emotion, then we should find the same effect when comparing an event that was initially associated with an own eyes perspective versus an event involving a shift to an own eyes perspective. In this example, both events are associated with adopting an own eyes perspective but the nature of how this perspective arises differs (i.e., whether it occurs due to a shift in perspective or not). Likewise, there should also be a reduction in emotion when the initial event is associated with an observer-like perspective versus an event involving a shift to an observer-like perspective. To further understand how shifting perspective influences emotion, we conducted a secondary meta-analysis focused on differences in shifting within own eyes or observer-like perspectives. This secondary meta-analysis was based on a subset of the studies from the main analysis[5] (see Table 4 for the comparison of conditions in these meta-analyses) and yielded 22 individual effects recruited from seven independent comparisons, seven studies, and seven articles. We predicted that shifted perspectives would reduce emotionality and that these effects would be evident irrespective of the type of perspective adopted (i.e., own eyes or observer-like). Like the main meta-analysis, we adopted a multilevel approach; thus, we clustered 22 individual effects in

[5] Apart from the subset of the articles from the main meta-analyses, an additional literature search did not reveal any other publication that could be included.

seven dependent comparisons, studies, and articles. The procedure for outlier detection, sensitivity analyses, publication bias assessment, effect size calculation, and moderator analyses were identical to the main meta-analysis.

Table 4
Comparisons in the Main and Secondary Meta-analyses

Main Meta-analysis: *Across Perspectives*	Shifted Own Eyes vs. Initial Observer-like Shifted Observer-like vs. Initial Own Eyes
Secondary Meta-analysis: *Within Perspectives*	Shifted Own Eyes vs. Initial Own Eyes Shifted Observer-like vs. Initial Observer-like

Outlier Detection and Sensitivity Analyses. There were no significant outliers. Cook's distance analysis indicated one potential influential case that might impact the overall effect, but leave-one-out analysis showed that removing any of the included studies did not substantially change the overall effect size (ranging from -.240 to -.290). Therefore, the final sample included 22 individual effects from seven independent comparisons, studies, and articles.

Overall Effect Size and Publication Bias Analyses

As predicted, we found a significant overall effect of shifts in perspective on emotionality (k = 22, Hedges' g = -.279, 95% CI [-.451, -.106], Z = -3.175, p = .001), revealing a small effect size in which shifted perspectives yielded reduced emotionality compared to initial perspectives (see Figure 2C). Thus, shifting to a novel perspective reduces emotionality, even when comparing event memories associated with the same vantage point (i.e., within perspective comparison). Egger's test results showed no publication bias, Z = -1.012, p = .311 (see Figure 2D). The results from Rosenthal's fail-safe N test showed that 245 additional effects would be required to change the overall effect, indicating that our dataset is unlikely to have publication bias[6]. There was also heterogeneity within the overall effect size, $Q(21) = 42.856$, $p = .003$, $I^2 = 55.475\%$, with $\tau^2 = .033$.

Moderator Analysis

As we specifically selected a subset of data, we had an inadequate number of effects for some moderator analyses, which would impair the power of the moderation models (Deeks et al., 2019). Therefore, we specifically focused on the moderators of interest with relatively even distribution across categories.

Event Characteristics

Event Assignment. We conducted a moderator analysis to examine whether instructions to elicit emotional events ($k = 10$) or self-selected events ($k = 8$) moderated the effect of shifting perspective on emotion. There was a significant difference based on the event assignment, $Q(1) = 4.407$, $\beta = .388$, $Z = 2.099$, 95% CI [.025, .750], $p = .035$, such that the decrease in emotion was larger for emotional (Hedges' $g = -.49$, $\beta = -.472$, $Z = -3.928$, 95% CI [-.707, -.236], $p < .001$) than self-selected events (Hedges' $g = -.08$, $\beta = -.083$, $Z = -.597$, 95% CI [-.359, .191], $p = .550$).

Initial Emotional Arousal. Similar to the main meta-analysis, we first standardized the emotional arousal scores in the initial perspectives as there was variability in how they were measured across studies. However, initial emotional arousal ($k = 18$) was not a significant moderator, Q(1) = 2.714, $\beta = -.195$, $Z = -1.647$, 95% CI [-.428, .037], $p = .099$.

[6] To further assess publication bias, we additionally aggregated the effects sizes recruited from dependent comparisons. Egger's test revealed no funnel plot asymmetry ($Z = -1.579$, $p = .114$) and Rosenthal's fail-safe N test also showed that 38 more effects are required to change the overall effect.

Visual Perspective Factors

Self-Visibility in Observer-like Perspective. Given that this secondary meta-analysis investigated *within* perspective effects, we could only examine the role of self-visibility within the observer-like perspective contrast by examining differences in whether participants were asked to visualize themselves when adopting an observer-like perspective (k = 6) or not (k = 5). The results indicated a significant difference in the effect size when observer-like descriptions emphasized self-visibility, $Q(1) = 23.023$, $\beta = .642$, $Z = 4.798$, 95% CI [.379, .904], $p < .001$. Specifically, there was a significant reduction in emotion between initial versus shifted observer-like perspectives when there was no emphasis on self-visibility, Hedges' $g = -.68$, $\beta = -.653$, $Z = -6.306$, 95% CI [-.856, -.450], $p < .001$. In contrast, there was no significant difference when the self-visibility was emphasized, Hedges' $g = .01$, $\beta = -.011$, $Z = -.129$, 95% CI [-.177, .155], $p = .896$ (see Figure 3B).

Initial Perspective of Events. We examined whether adopting the initial perspective spontaneously (k = 14) or forced (k = 8) influenced the effect size. The results indicated that the overall effect was significant regardless of how the initial perspective was elicited, $Q(1) = .723$, $\beta = -.175$, $Z = -.850$, 95% CI [-.578, .228], $p = .394$.

Change in Vividness. We also similarly examined whether the change in vividness between the initial and shifted perspectives moderated the influence of shifting perspective on emotion. We excluded one significant outlier as its z-score was lower than -2.50. However, change in vividness (k = 17) was not a significant moderator, Q(1) = .219, $\beta = .049$, $Z = .468$, 95% CI [-.157, .255], $p = .639$.

Type of Perspective. We coded whether the type of perspective was own eyes (k =11) or observer (k = 11). Results showed that type of perspective was not a significant moderator, suggesting that shifting perspective reduced emotion irrespective of the specific perspective elicited, $Q(1) = .083$, $\beta = .036$, $Z = .288$, 95% CI [-.213, .286], $p = .773$ (see Figure 5). Thus, shifting to a novel perspective impacts emotionality equally within events associated with either own eyes or observer-like perspectives.

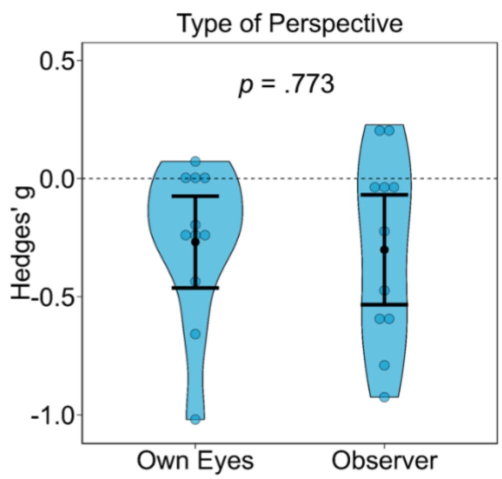

Figure 5. *Type of Perspective***.** Results of moderator analyses for the type of perspective in the secondary meta-analysis. Each data point represents an individual effect size. Black dots depict the aggregated effect size in each moderator category, and the error bars display the 95% CIs of the mean. *p*-value indicates the significance of the overall moderation model.

Discussion

In the current meta-analysis, we investigated the impact of shifts in visual perspective on emotion in event memories. We found a small overall effect reflecting a reduction in emotionality in event memories following a shift in perspective. A secondary meta-analysis further supported these findings by revealing a similar pattern of effects of shifting perspective when comparing event memories within the *same* perspective (i.e., shifted own eyes compared to initial own eyes). Consistent with the asymmetrical pattern of shifts of perspective on emotion in the literature (e.g., Berntsen & Rubin, 2006; Butler et al., 2016; Robinson & Swanson, 1993), we found that the direction of the shift moderated the strength of the across perspective effect size. Shifting from an own eyes to an observer reduced emotionality, but the opposite shift in perspective had no significant effects on emotionality. Our findings further revealed that the asymmetrical pattern of shifting was linked to reductions in the vividness of event memories, suggesting that shifting across alternative perspectives reduces emotion when it leads to mnemonic changes in the quality of visual information recalled.

The current meta-analytical findings support prior empirical research indicating that shifting visual perspective during event retrieval reduces emotion, which we quantified here as a small effect size. Previous meta-analyses comparing own eyes and observer-like perspective have also shown a change in emotionality due to visual perspective (e.g., Guo, 2022; Murdoch et al., 2022) and psychological distancing in general (Moran & Eyal, 2022), but have not explicitly examined the influence of *shifting* to a novel perspective on emotion in event memories. The current findings significantly extend this research by demonstrating that adopting a novel perspective is the key driver of changes in events rather than the particular perspective adopted per se. Here, we investigated shifts in perspective by comparing differences in emotionality when participants were asked to initially recall events from a particular point-of-view and then to shift to a novel perspective. Moreover, we also found that shifting perspective reduced the emotionality of event memories even when comparing within the same type of perspective (i.e., initial own eyes to shifted own eyes; initial observer to shifted observer). These findings have important implications for understanding how visual perspective contributes to emotional regulation (e.g., Wallace-Hadrill & Kamboj, 2016; Powers & LaBar, 2019). Prior research has typically focused on how adopting an observer-like perspective serves a distancing function, which helps to dampen the intensity of emotions experienced in memories. However, the current findings indicate that it is the change in the perspective, rather than the type of perspective adopted which may be the more critical factor that influences emotion in event memories.

Supporting the asymmetrical pattern demonstrated in the literature (e.g., Berntsen & Rubin, 2006; Robinson & Swanson, 1993; Sekiguchi & Nonaka, 2014) we found that the direction of the shift in perspective was a key moderator of the effect size, such that shifting from an own eyes to an observer-like perspective reduced emotion but the opposite shift in perspective from observer-like to own eyes had no impact on emotion. One explanation is that shifting from an own eyes to an observer-like perspective reflects adopting a more novel viewpoint, whereas shifting from an observer-like to an own eyes perspective typically reflects re-adopting the original viewpoint memories were encoded from.[7] Thus, shifting from an own eyes to an observer-like perspective would be expected to lead to greater mnemonic changes. Supporting this idea, we found that decreases in vividness were associated with reduced emotionality when shifting from an own eyes to an observer-like perspective but not when shifting in the reverse direction. These findings are consistent with mnemonic accounts of emotional regulation that emphasize how reductions in emotion arise when the characteristics of memories are altered due to reconstructive memory processes (Nørby, 2019) and provides

[7] Memories can be formed from observer-like perspectives under some circumstances, but own eyes perspectives are more typical for the vast majority of memories.

an explanation why shifting from an own eyes to an observer-like perspective attenuates emotion. We focused on vividness here because this subjective rating is frequently reported to in the literature. However, changes in other characteristics of events, such as the episodic and semantic details (e.g., Akhtar et al., 2017; King et al., 2022), could also contribute to whether shifts in perspective lead to emotional regulation.

Observer-like perspectives differ in whether they emphasize self-visibility (e.g., Kinley et al., 2021), which can influence the extent of emotions people experience during remembering (Sutin & Robins, 2008). Although observer-like perspectives are sometimes defined as seeing oneself in the event during retrieval or mental simulation, the visibility of the self varies (Kinley et al., 2021), potentially due to the variation in the height, distance, and location where an observer-like vantage point was adopted from (Rice & Rubin, 2011). Prior theories have proposed that the impact of shifts in visual perspective on emotion is dependent upon the self-appraisals generated (Sutin & Robins, 2008), such that adopting an observer-like perspective can reduce emotion if it leads people to detach from the event and evaluate it objectively, but magnify emotion if it leads to greater focus of attention on the self. Supporting this idea, adopting an observer-like perspective is linked to a greater number of details associated with one's physical appearance and perceptual details related to the self-perspective (e.g., King et al., 2022; McIsaac & Eich, 2002). However, few studies have directly examined the role of the visibility or saliency of the self and its relationship to visual perspective. In one study, Kinley et al. (2021) asked participants to imagine self-relevant future events and to rate the visual perspective they adopted and the emotional intensity they felt. If they reported that they imagined events from an observer-like perspective, they were also asked to indicate how much they saw themselves in the event. Kinley and colleagues found that higher self-visibility when adopting an observer-like perspective while imagining self-relevant future events was associated with higher emotional intensity. In another study, Marcotti and St. Jacques (2021) demonstrated that the presence of the self in photo cues influenced the degree of emotional intensity people reported during memory retrieval. They found that when memories were cued with observer-like photos, the presence of the self in the photograph boosted emotional intensity ratings during remembering. The current meta-analytical findings significantly extend this research by synthesizing findings from across the literature to demonstrate that when instructions emphasize self-visibility while adopting an observer-like perspective, there is an attenuation in the reduction in emotion during shifting perspective. Notably, here we found effects of self-visibility in both the across and within-perspective meta-analytical comparisons, demonstrating the robustness of this effect in different contexts.

Future Research. The current findings can inform future research investigating the influence of visual perspectives on emotion in event memories in several ways. First, we found that instructions when initially adopting a visual perspective in events did not change the overall effect on emotion, such that both spontaneous or forced perspectives were equally likely to show a reduction in emotion when shifting perspective. Relatively fewer studies have examined shifts from observer-like to own eyes perspectives due to challenges in eliciting AMs that are spontaneously recalled from an observer-like perspective (e.g., Radvansky & Svob, 2019). For example, it can be difficult to elicit an equal number of events that are spontaneously recalled from an observer-like perspective when also controlling for the relative remoteness of events (e.g., King et al., 2022; Sekiguchi & Nonaka, 2014). It remains to be understood whether forced instructions lead people to select memories naturally associated with own eyes or observer-like perspectives or whether such instructions sometimes lead people to shift their natural perspective in the memory. Nonetheless, the current findings suggest that instructions that force observer-like perspectives when memories are initially recalled are a useful methodology for eliciting memories to understand how experimental manipulations of perspective reshape emotional and other characteristics of memories.

Second, the language used to describe visual perspective in the instructions varied across studies in terms of highlighting the immersivesness in an own eyes perspective or emphasizing the self-visibility in an observer-like perspective. For example, some studies asked participants to adopt an own eyes perspective by going back in time and reliving the experience again, and to adopt an observer-like perspectives by taking a step back and watching the event unfold (e.g., Kross et al., 2005). In contrast, other studies adopted simpler language, such as simply remembering the event from a first- or third-person perspective or using more neutral language (e.g., Vella & Moulds, 2014). Here we found that subtle differences in the language used to emphasize self-visibility can contribute to differences in the impact on emotionality during remembering. Future work directly manipulating how visual perspective is described and understood by participants would be fruitful for delineating the key factors about shifting to a novel perspective that may contribute to changes in emotional experience during remembering.

Finally, there was a lack of consistency across studies in how key features that influence visual perspective were measured. For example, prior studies showed that the same asymmetrical pattern emerges for subjective sense of reliving during recall (Berntsen & Rubin, 2006). Other findings showed that observer-like perspectives are more prevalent for remote versus recent events (Rice & Rubin, 2009), which might influence the impacts of shift in perspective. However, not all studies measured various event phenomenology or controlled for event remoteness for AMs and future events. This inconsistency challenges examining the moderator role of these variables in the present study. Future studies can include other event characteristics and control for event remoteness by including more definite temporal features for the AMs and future events (e.g., events that could happen in the next 1 to 5 versus 5 to 10 years) to further explore whether they can predict the change in emotion due to shifts in perspective.

Limitations. Despite the novelty of the current findings, there were also a few limitations in synthesizing the findings in the literature. One limitation is that current reporting standards in the literature made it difficult to examine the impact of shifting perspective on emotionality based on the age of the memory. Although we included studies that ranged from relatively recent (e.g., last few months; Gu & Tse, 2016) to more remote (e.g., last five years; Crawley, 2010), the majority did include sufficient information to characterize the average remoteness of memories in a meaningful way. For example, instructions to elicit memories within the last five years may elicit a mix of memories that range from hours to several years old. Prior research has demonstrated that remote events are more likely to be associated with adopting an observer-like perspective (e.g., D'Argembeau & Van der Linden, 2004; Rice & Rubin, 2009). At the same time, remote events also tend to be associated with fading of affect and vividness (Sutin & Robins, 2007; Talarico et al., 2004), which might further mitigate the impact of shifting perspective on emotion. Future meta-analyses would benefit from better reporting of the age of the memories elicited and study designs that separate potential differences of shifting perspective for both recent and remote events.

Another limitation was that the sample size was smaller than the suggested number of ten effect sizes in each category for some of the moderators in our secondary meta-analysis (Deeks et al., 2019). For example, there was a significant difference in event assignment in the secondary meta-analysis, such that shifting perspective decreased emotion to a greater degree when emotional events were targeted, compared to self-selected events. However, this result should be interpreted with caution since there were less than ten individual effects in the moderator categories and we did not find the same effect in the main meta-analysis when there were more individual effects in each category. Therefore, future studies are required to clarify the impact of event assignment on shifts in visual perspective.

Conclusion. The present meta-analysis reveals that shifts in visual perspective are a key factor that influences the emotionality of event memories, contributing to emotional regulation of experiences from our personal past. Specifically, we found a reduction in emotionality when shifting from an initial perspective to a novel one during retrieval rather than solely adopting a specific vantage point. Supporting this interpretation, a secondary meta-analysis revealed that shifts within the same perspective (i.e., comparing an initial own eyes to a shifted own eyes perspective) were similarly associated with reduced emotionality. Moreover, we also found an asymmetrical pattern of shifting, such that shifting to a novel perspective (i.e., from own eyes to observer) was associated with a reduction in emotion, whereas shifting back to a more typical perspective (i.e., from observer to own eyes) had no effect on emotion. This asymmetrical pattern of effects was linked to changes in the vividness of visual imagery associated with remembering, such that decreases in vividness following a shift from an own eyes to an observer-like perspective predicted greater reductions in emotionality when shifting perspective, which supports mnemonic accounts of emotional regulation (Nørby, 2019). More broadly, shifts in perspective can impact our social interactions with others (Marigold et al., 2015) and how we evaluate the morality of experiences (Hu & Tao, 2021) by changing the emotionality people attribute to event memories.

Declarations

Open Practices Statement and Code Availability

The data and materials are available at osf.io/veyk6 and the meta-analysis was not preregistered.

Conflict of Interests

We have no known conflict of interest to disclose.

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Ethics Approval

Ethics approval is not applicable given that the current study is a meta-analysis of previously published and unpublished data with ethics approval.

Consent of Participants

Not applicable.

Consent for Publication

Not applicable.

Authors' Contribution

Selen Küçüktaş: Conceptualization, Methodology, Software, Validation, Formal Analysis, Data Curation, Writing - Original Draft and Editing, Visualization, Project Administration.

Peggy L. St. Jacques: Conceptualization, Methodology, Validation, Resources, Writing - Original Draft and Editing, Writing - Review and Editing, Supervision, Funding Acquisition.

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