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Haunting Images of Forgotten Films: Reddit Movie Threads Reveal Emotion–Memory Interactions

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Abstract

Emotional events are subjectively vivid, but whether this vividness reflects superior objective memory remains debated. We distinguish three competing hypotheses: (1) Emotion does not enhance objective recall despite subjective vividness, (2) Emotion selectively enhances central sensory details while impairing peripheral contextual information, or (3) Emotion enhances all memory aspects, with benefits spreading from central to peripheral details. We tested these hypotheses using a naturalistic dataset from three Reddit discussion forums (“subreddits”), where users post remembered details of forgotten movies. Analyzing 1,509 posts from movie identification subreddits, we found that negative emotion strongly predicted which movies were remembered (supporting hypotheses 2 and 3 over hypothesis 1), with horror and thriller movies significantly overrepresented. Scene-level details were recalled more frequently and accurately than movie-level information, suggesting that emotion preferentially affects central, sensory details. However, both scene-level and movie-level details were enhanced by negative emotion without a significant interaction, supporting the third hypothesis that emotion broadly enhances memory while prioritizing central information. These findings suggest that negative emotion enhances both the selectivity and overall strength of long-term episodic memories, with implications for understanding emotional memory in naturalistic contexts.

Keywords: Emotion; Memory; Long-Term Memories; Natural Language Processing; Sentiment Analysis; Social Media

Introduction

Memories for fearful and stressful events are often recalled with subjective vividness and clarity. There is considerable debate, however, as to whether this subjective vividness is accompanied by better objective memory for the event.

This debate is fueled by the complicated dynamics of memory and emotion. At the time of their encoding, strong negative emotions exert powerful neurochemical modulation of memory circuits, some of which might favor (e.g., dopamine release: Shohamy and Adcock, 2010) and some which may hinder (e.g., cortisol release: Lucassen et al., 2006) the memory’s future retrievability. Furthermore, memories, by their very nature, connect multiple types of information; researchers often distinguished between “central” aspects (e.g., the most vivid and distinctive sensory information) from “peripheral” details, (e.g., the larger spatial and temporal context in which the event occurred. Emotion, therefore, might affect these types of information differently. Finally, emotional events are also more likely to be later revisited, making them

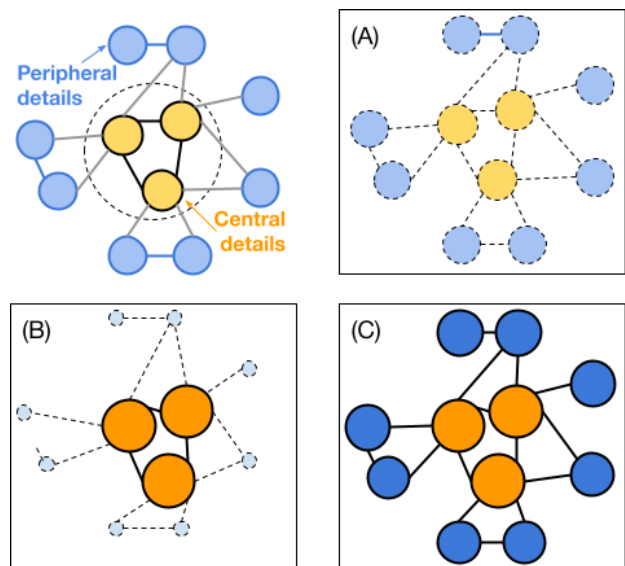


Figure 1: Three possible hypotheses of how emotion might differentially enhance (larger circles, brighter colors), or hinder (smaller circles) the central and peripheral details in a memory.

more prone being significantly changed and altered over time (Zoellner et al., 2025).

Hypothesis 1 holds that, despite their greater subjective vividness, highly emotional events are not objectively recalled better and their apparent vividness masks the effects of normal underlying forgetting processes (Christianson, 1992; Figure 1A). Studies of flashbulb memories of distressing events, for example, have repeatedly shown that significant details of the original event are forgotten at a rate comparable to that of mundane memories, implying similar processes (Neisser & Harsch, 1992; Talarico & Rubin, 2003).

Hypothesis 2 holds that negative emotions would selectively enhance retention for the central, sensory details of the event, while peripheral, conceptual, and contextual details might instead be hindered (Kensinger, 2009; Figure 1B). This imbalance might be caused, for example, by emotionally charged central details diverting attention, at the moment of encoding, from other details, as exemplified in the “weapon focus” effect (Loftus et al., 1987). This imbalance might also result from some post-encoding process, such as retrieval-induced forgetting (Anderson et al., 2000), whereby later re-

trieval of emotional-charged sensory information might lead to increased forgetting of the associated peripheral and contextual details.

Finally, Hypothesis 3 is that emotion ultimately enhances the retrievability of all aspects of a memory, both central and peripheral. This is because, even if the sensory aspects of a memory carry stronger emotions, their effect would eventually spread to the peripheral aspects as well (Figure 1C). This is because less emotionally charged peripheral details ultimately benefit from their association with the more emotionally charged central details, either during encoding or, later, during retrieval (Cohen & Kahana, 2022; Smith et al., 2021). This effect is best shown, for example, in fear generalization studies, in which fear-induced responses are observed to spread from the conditioned stimulus to associated cues (Dunsmoor & Paz, 2015; Dymond et al., 2015).

It is challenging to experimentally test these hypotheses for a number of reasons. In laboratory settings, it is difficult to maintain participant retention over long periods of time, and it is unethical to repeatedly subject them to intense negative emotions. In field studies, such as those carried out after naturally occurring catastrophes, it is difficult to establish the ground truth needed to objectively evaluate memory accuracy. In both settings, it is extremely difficult to obtain a large sample size while being able to validate the degree to which memory recollection is accurate.

In this study, we work around these difficulties using social media data. Specifically, we focus on data from the social platform Reddit, which allows users to open discussion threads related to different topics or *subreddits*: In particular, three subreddits (r/NameThatMovie, r/WhatstheMovieCalled, and r/WhatisThatMovie) are devoted to helping users identify movies they have forgotten. In these threads, users post details they can remember from the forgotten movie, while other members reply and attempt to help identify the movie.

By their very nature, these subreddits represent a unique opportunity to study the effects of emotion on memory. The complex nature of movies provides a natural way to distinguish between specific central details, such as individual scenes, and more conceptual and peripheral aspects, such as story arc, themes and motifs, and production characteristics (e.g., whether it was a TV episode or a feature movie). In addition, movies are explicitly designed to elicit powerful emotions and leave lasting memories, and this consideration has contributed to the enduring popularity of movie clips as distressing stimuli in experimental research on emotion (Carleton et al., 2010; Holmes & Bourne, 2008; Marks & Zoellner, 2014). Unlike naturalistic studies of traumatic events, Reddit threads provide an objective estimate of the accuracy of the posted description. Unlike most experimental participants, Reddit users are intrinsically motivated to provide as many details as possible of what they can remember. Finally, the availability of a large and varied dataset makes it possible to move from nominal to parametrical manipulations of how emotional intensity affects memory quality.

Materials and Methods

Reddit Data

Reddit data was downloaded on September 1, 2025 using the Reddit API through an R interface (provided by the package *RedditExtractoR*). Reddit's fair use policy does not allow to collect data extending more than 1 year in the past; thus, the posts span the period from September 1, 2024 to September 1, 2025. A total of 1,509 posts and 24,611 comments were collected from the three subreddits of interest (r/NameThatMovie, r/WhatstheMovieCalled, and r/WhatisThatMovie). A comparison set of data was collected from three other movie-related subreddits (r/Movies, r/TrueFilm, and r/MovieSuggestions), totaling 1,081 posts.

Sentiment Analysis

The emotional characteristics of the Reddit posts were extracted using the Valence Aware Dictionary and sEntiment Reasoner (VADER: Hutto and Gilbert, 2014), a rule-based sentiment analysis algorithm specifically developed to examine brief texts and social media posts. VADER uses word-level knowledge to extract positive, neutral, and negative sentiment scores, as well as a compound score.

Movie Genre

A movie's genre provides important clues about the nature of the emotions elicited by the movie, but there is no agreement on the exact categories to be used (Laetz & Lopes, 2008). In this study, we defined genre as one of 21 top-level categories provided by the Internet Movie Database (IMDb), which is the largest database of movies and television products.

The IMDb was also used to generate a representative sample of titles against which the distribution of movies genres reported in Reddit posts could be compared. Such a sample was created by restricting the full list of IMDb titles to (1) Entries produced between 1950 and 2025; (2) Entries with > 100 ratings, thus considering only those entries with a minimum likelihood of having been seen; and finally (3) Entries consisting exclusively of movies, TV movies, TV series, and TV miniseries, thus excluding irrelevant formats (e.g., game and reality shows) as well as the individual episodes of series and miniseries. The final dataset consisted of 174,604 individual titles.

Note that IMDb allows for up to three different genre labels per movie; for example, the 1979 movie "Alien" is categorized as belonging to both the "Horror" and "Science Fiction" genres. For compatibility with later analysis, all movies belonging to multiple genres were assigned to a single category by randomly selecting one of the associated genre labels.

Automated Natural Language Processing Analysis

Natural Language Processing analysis of Reddit data was carried out using a Gemma 3.2, an open-source 2-billion parameter Large Language Model (Mesnard et al., 2024). Specifically, Gemma was used to analyze Reddit posts to extract the

most likely genre the movie belongs to (see below); to categorize the information provided in the original posts as pertaining to specific scenes vs. general movie information; and to analyze the accuracy of the remembered details based on the information later provided by other users in the comments. The use of an open-source LLM ensures the reproducibility of the analysis. Gemma was specifically chosen because, in a series of pilot analysis, it outperformed models of similar complexity, such as DeepSeek R1 and Qwen 3.

LLM Validation Three tests were carried out to validate the LLM’s genre categorizations. First, Gemma’s genre assignments were compared to a subset of 50, unambiguous Reddit posts that were used to establish a ground truth, against which Gemma 3.2 achieved 100% accuracy in classification. Second, Gemma’s genre assignments were compared to the presence of explicit genre keywords in the original post’s title (e.g. “need help to identify a *horror* movie”). Gemma’s distribution of genre tags had a $r = .77$ correlation ($p < 0.001$) with the genre mentions in the post titles. Finally, Gemma’s reliability was assessed through a test-retest comparison, re-running the genre categorization task a second time. On average, Gemma assigned the exact same genre tag to the same post in 92.9% of the cases.

Results

Sentiment Distribution Across Reddit Posts

Common to all hypotheses is the idea that emotion enhances the memorability of at least some specific details of the movie. If so, we would expect that movie descriptions provided by the original posters would contain highly positive or highly negative emotional details. To test this prediction, the compound sentiment of each of the original 1,509 posts was analyzed automatically using VADER (Hutto & Gilbert, 2014), yielding a compound score from -1 (most negative emotion) to $+1$ (most positive emotions).

As expected, the distribution of sentiment scores was bimodal (Figure 2, colorbars; Hartigan’s dip = 0.088, $p < 0.001$), suggesting that movies that elicit stronger emotional content are more likely to be at least partially remembered. This distribution, however, might be partially driven by the content and the medium, given that movies are designed to elicit emotions and that social media dynamics incentivize sharing highly arousing content (Knutson et al., 2024).

To examine this alternative explanation, the sentiment distribution in the target subreddits was compared against the control sample of 1,081 posts from three other popular movie-related subreddits, which include general movie-related content (r/Movies), movie reviews (r/TrueFilm), and movie recommendations (r/MovieSuggestions). Although the sentiment distribution in these posts was also bimodal, it differed significantly from the distribution of experimental sample ($\chi^2(10) = 546.85, p < 0.0001$). Specifically, and consistent with our hypotheses, the remembered details of forgotten movies tend to skew towards negative sentiment, exhibiting

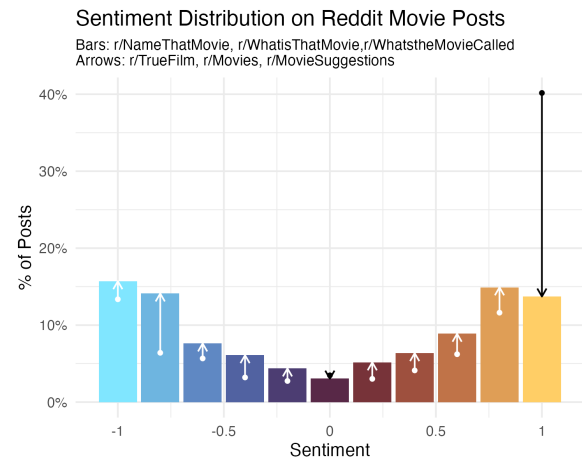


Figure 2: Sentiment distribution across the movie identification subreddits (bars) compared to other movie-related posts (points). Arrows represent the direction of change; colors represent the compound sentiment.

less positive sentiment (Figure 2, points).

A corollary of this prediction is that movies genres that elicit strong negative sentiment, such as horror or thriller movies, would be overrepresented in the data. To test this hypothesis, all the original posts were classified by the large language model Gemma 3.2 as belonging to one of the 21 recognized genres of the IMDb (See Materials and Methods). The genre distribution in the Reddit movie identification posts was then compared against a representative sample of 174,604 movies and TV series produced between 1950 and 2025 (see Materials and Methods).

As predicted, the distribution of genre characterization in the Reddit posts differed significantly from the genre distribution in ($\chi^2(20) = 3,713.68, p < 0.0001$). Specifically, the Reddit posts showed an overrepresentation of horror, thriller, and science fiction movies, and an under-representation of documentaries, comedies, and dramas, as shown in Figure 3.

Figure 3 also suggests that the overrepresentation of a genre on Reddit is related to the mean sentiment associated with its posts. To test this hypothesis, we computed an exceedance prevalence metric for every genre, defined as the difference between its prevalence among Reddit posts and its prevalence in the IMDb dataset. Consistent with the hypothesis that negative emotions increase the retention of movie details, the exceedance prevalence of a genre on Reddit (operationalized as the difference between the percentage of its Reddit posts vs. its representation on IMDb) was significantly predicted by the average mean sentiment of its posts ($R^2 = 0.38, \beta = -25.94, p = 0.01$; Figure 4).

One possible counter-explanation is that this effect is driven by social media dynamics: genres that evoke stronger negative emotions may simply garner more engagement, thereby incentivizing users to post about them. If this were the case, one would expect that posts referring to genres that are more com-

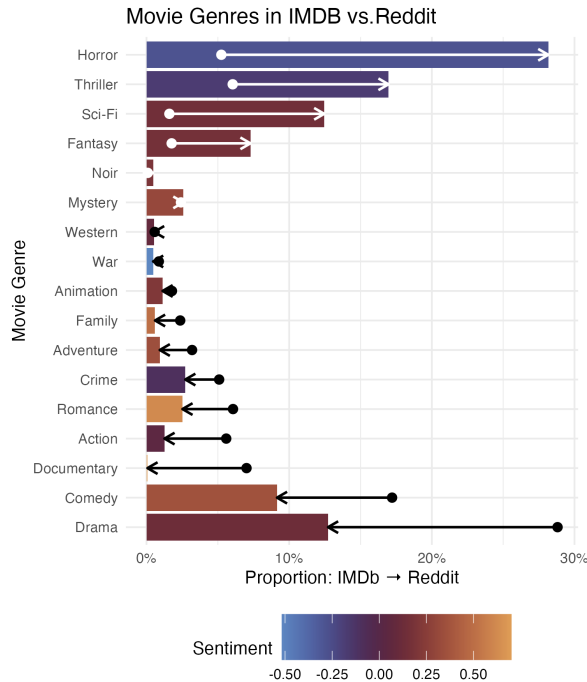


Figure 3: Prevalence of movie genres in Reddit posts (bars), compared to the Internet Movie Database (IMDb: points). Arrows represent the direction of change; colors represent mean sentiment across posts within genre.

mon would also generate the largest number of comments. No significant correlation, however, was found between the exceedance prevalence of a genre and the mean number of comments that its posts would elicit ($\beta = 0.00$, $CI = [-0.01 - 0.02]$, $p = 0.555$: Figure 5).

In summary, our analyses suggests that negative emotions have a strong influence on which movies Redditors will re-

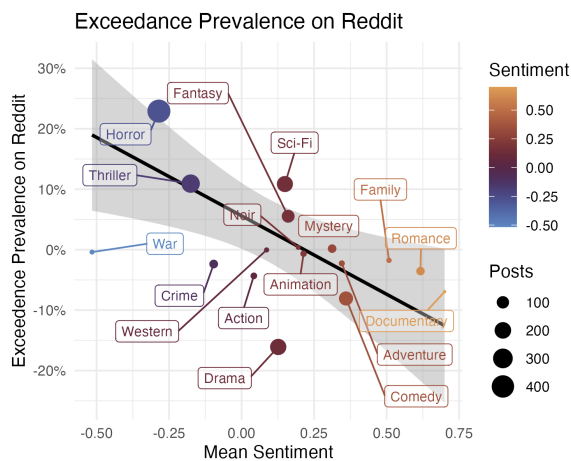


Figure 4: Negative emotion drives the overrepresentation of genres in Reddit posts.

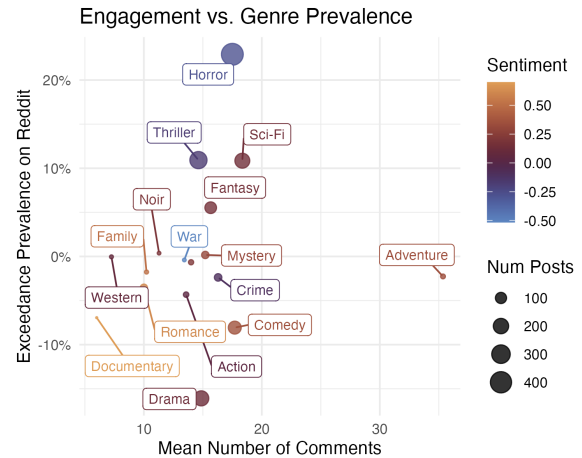


Figure 5: Community engagement (number of comments) is not related to either sentiment of genre prevalence.

member details of, thus ruling out Hypothesis 1.

Specific vs. General Detail of the Description

While the Hypothesis 1 (Figure 1A) does not distinguish between the different components of a memory, Hypotheses 2 and 3 predict that strong emotions would differentially impact the central or sensory details vs. the peripheral or conceptual information. In the domain of movies, the distinction between central and peripheral details aligns naturally with the distinction between specific scenes vs. the larger movie context in which individual scenes are embedded, such as plot and story arc or the actors who played the characters (Lee & Chen, 2022).

To analyze the effects of emotion at this level of granularity, we used the Gemma 3.2 model (see Materials and Methods) to classify the descriptions provided in every post as preferen-

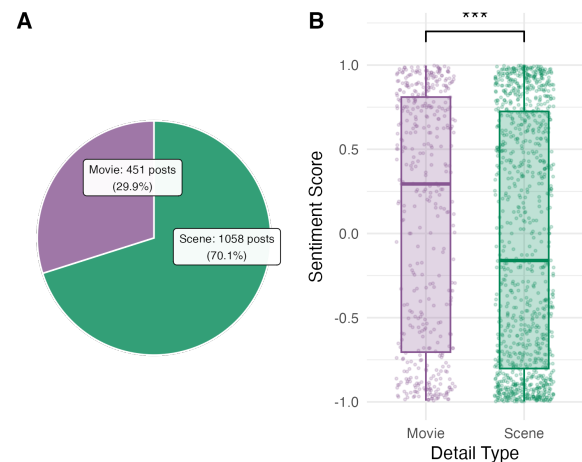


Figure 6: (A) Distribution of movie-level vs. scene-level descriptions in Reddit posts; (B) Sentiment distribution in posts preferentially providing movie- vs. scene-level details.

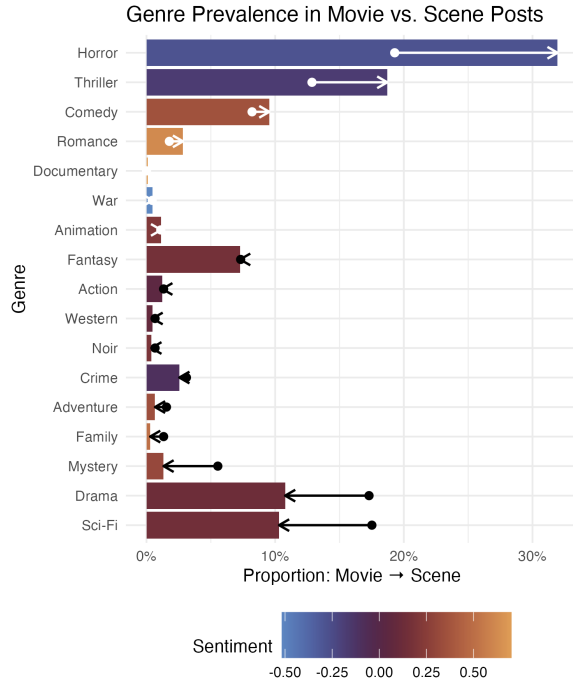


Figure 7: Changes in genre prevalence between Reddit posts providing movie-level (points) or scene-level descriptions (bars). Colors represent mean sentiment across posts.

tially referring to specific scenes vs. the whole movie. Overall, it was found that the greatest majority (70.1%) of all posts preferentially reported scene-level details, rather than movie-level details (Figure 6A). This categorical distribution departs significantly from chance ($\chi^2(1) = 244.17, p < 0.0001$) and is even more surprising when consider that movie-level information would be potentially more helpful than specific scenes in identifying the movie.

The over-representation of information at the level of specific scenes, rather than for the whole movie, is consistent with the idea that stronger emotions facilitate the retrieval of central rather than peripheral information (Lee & Chen, 2022). This is further confirmed by two more pieces of evidence. First, scene descriptions have significantly lower sentiment scores than movie descriptions, suggesting that more frequent recall for scene information might be driven by their more negative emotional content ($M = -0.04, SD = 0.74$) compared to movie-level details ($M = 0.10, SD = 0.73, t(855.07) = 3.45, p < 0.0001$; Figure 6B). Second, we again see an increase in the prevalence of horror and thriller movies when Reddit posts concern scene-level, rather than movie-level, details (Figure 7, $\chi^2(16) = 159.98, p < 0.0001$).

Once more, a statistical linear model found that the difference in genre prevalence could be predicted by the mean genre sentiment, weighted by precision ($R^2 = 0.33, \beta = -12.95, CI = [-23.54 - 2.36], p = 0.020$, Figure 8).

Both Hypothesis 2 (Figure 1B) and Hypothesis 3 (Figure 1C) also predict that the accuracy of the description for movie-

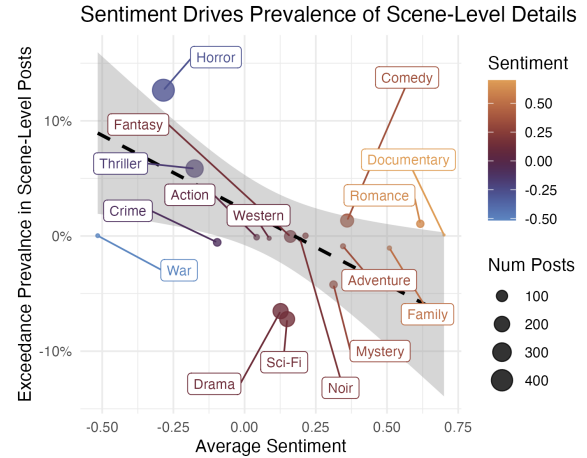


Figure 8: Negative emotion drives genre prevalence in posts that preferentially provide scene-level details

level description would be, on average, lower than the descriptions from scenes. To determine the accuracy, Gemma was prompted to carry out a detailed analysis of the details provided in each of the 1,509 posts, comparing them against the details provided in the corresponding 24,611 comments and responses. Accuracy was measured as the proportion of details that, in the responses, were eventually found not to match the movie, once it was identified. Thirty-nine posts (2.5% of the total) were excluded for having no associated comments.

Accuracy was significantly higher in posts reporting specific scenes ($M = 0.61, SD = 0.27$) than in posts reporting general movie information ($M = 0.54, SD = 0.28; t(799.52) = -4.19, p < 0.0001$).

Sentiment Effects on Movie- vs. Scene-Level Recall

Overall, these results confirm that emotion preferentially increases the accuracy of memory for specific scenes, rather than the accuracy of contextual details about the movie. This finding, however, is compatible with both the second and the third groups of theories. What sets these two hypotheses apart is the underlying mechanisms that results in this difference.

If emotion selectively impairs the recollection of peripheral information (Hypothesis 2, Figure 1B), then stronger negative sentiment would be associated with poorer accuracy for movie-level details but higher accuracy for scene-level details. If, on the other hand, both types of details are similarly affected by emotion (Hypothesis 3, Figure 1C), we should find that both movie-level and science-level details are more accurate when the sentiment is more negative. In statistical terms, the second hypothesis predicts an interaction between the type of information (scene- vs. movie-level) and sentiment, while the third does not.

To test these predictions, we examined the data using a more complex linear model. In the new model, each post's recall accuracy was used as the dependent variable and its sentiment, the type of information recalled (scene- vs. movie-level), and

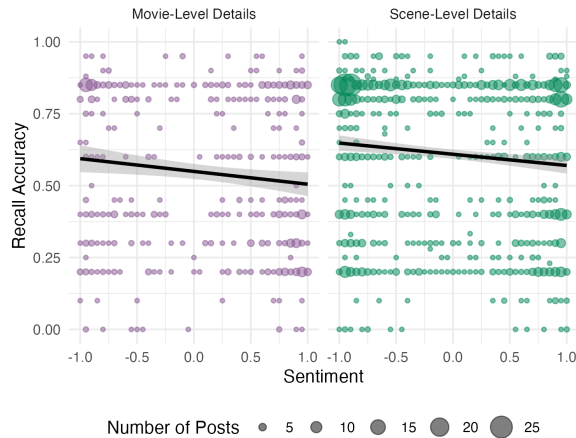


Figure 9: Negative emotion has similar effect on the recall of movie-level and scene-level information.

their interaction were the independent predictors.

Both sentiment ($\beta = -0.06$, $CI = [-0.10 - -0.01]$, $p < 0.009$) and type of information ($\beta = 0.08$, $CI = [0.04 - 0.11]$, $p \ll 0.001$) were significant. Their interaction, however, was not significant ($\beta = 0.01$, $CI = [-0.05 - 0.06]$, $p = 0.791$), suggesting that, while scene-level details were better recalled than movie-level details, both were better recalled when associated with strong negative emotions (Figure 9). To test the degree to which the lack of interaction could be taken as evidence, a Bayes factor analysis, comparing this model against a simpler one with no interaction, resulting in a Bayes Factor of $BF_{01} = 9.06$. This indicates that the observed data are nine times more likely to occur under the assumption that there is no interaction, providing substantial evidence in favor of the null hypothesis. In turn, this further confirms that emotion is extremely unlikely to differentially affect scene-level and movie-level details.

Discussion

This study leveraged naturalistic data from social media to address a long-standing debate about how emotion affects different aspects of memory. Our findings provide clear support for the hypothesis that negative emotions enhance memory broadly rather than selectively impairing peripheral details while enhancing central ones. First, movies associated with stronger negative emotions were significantly overrepresented in users' memory reports compared to their prevalence across all movies produced in the same period. This overrepresentation was directly predicted by sentiment scores and could not be explained by social media engagement patterns, providing evidence against the idea that emotional events are objectively remembered better simply because they are more discussed. Second, consistent with the distinction between central and peripheral information, scene-level details were both more frequently reported and more accurately recalled than movie-level contextual information. Third, and most critically for

distinguishing between competing theories, negative emotion enhanced the accuracy of both scene-level and movie-level details without a significant interaction. Together, these results support a nuanced view in which emotion prioritizes central/sensory information overall, while also strengthening memory more generally.

Several limitations qualify these conclusions and point to important directions for future work. The first concern is platform bias: our dataset reflects the behavior of Reddit users who choose to post in specific threads, and these users may not be representative of the broader population. Both the specific sample and the platform-specific dynamics that produced our data could influence, for example, the apparent prevalence of certain genres and the distribution of detail types, thus limiting the generalizability of our findings.

A second limitation concerns generalization from fictional events to lived experiences: remembering a movie involves recalling events that the rememberer did *not* personally participate in. Although some frameworks (such as Event Memory Theory: Rubin and Umanath, 2015) suggest a unified account for experienced and non-experienced events, it remains an open question to what extent the mechanisms that govern emotional enhancement (or narrowing) operate similarly across memories for real vs. fictional events.

Third, our operationalization of “central” versus “peripheral” information is necessarily imperfect because centrality is partly viewer-dependent: What counts as a central detail may vary across individuals depending on prior knowledge of the film, attentional focus, personal relevance, and even the specific goal of the poster. In our setting, “scene-level” descriptions may be more diagnostic for identification and thus more likely to be produced, independent of their intrinsic centrality in the original viewing experience or the ease with which they are remembered. This viewer- and task-dependence suggests caution in mapping scene-level details directly onto “central” details and movie-level details onto “peripheral” details.

Finally, while we validated key automated classifications, our analyses remain correlational and depend on computational measures of sentiment and content. These tools may introduce systematic biases (e.g., genre-dependent language, sarcasm, or community-specific jargon) that could affect estimates of emotional intensity and detail type.

Despite these limitations, the present results demonstrate the value of mining naturalistic social media data to test foundational questions in cognitive psychology, and they motivate further work that triangulates across platforms, tasks, and event types to clarify how emotion shapes memory for both lived and mediated experiences.

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