

Mechanisms of Cognitive Fatigue in Continuous Social Media Browsing

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Abstract: Continuous social media browsing exposes users to rapid content changes, dense information, emotional messages, and repeated choices. Although browsing often feels easy, it places constant pressure on attention, working memory, judgment, and self-control. This paper examines the main mechanisms through which prolonged browsing produces cognitive fatigue. Rapid switching between unrelated posts breaks attention into short periods and makes stable focus harder to maintain. Large amounts of text, images, videos, and comments place pressure on working memory and lead to shallow processing. Unfinished thoughts and emotional reactions may remain active after users move to new content, creating cognitive residue. Browsing also requires many small decisions, including whether to watch, skip, like, share, or respond. These repeated choices may weaken judgment and make it harder to leave the platform. Emotional shifts, social comparison, negative content, and online conflict add further mental demands. Uncertain rewards and endless feeds encourage users to continue scrolling even after pleasure has declined and fatigue has appeared. The loss of natural stopping points also weakens time awareness and allows browsing to replace rest and sleep. The paper argues that cognitive fatigue develops through a cycle in which stimulation leads to overload, overload reduces self-control, and weaker control extends browsing. Clear browsing goals, fixed stopping points, fewer notifications, screen-free rest, and less demanding platform design may help reduce this fatigue.

Keywords: cognitive fatigue; social media browsing; attention fragmentation; working memory overload; decision fatigue; reward expectation; continuous scrolling

1. Introduction

Social media browsing is now a common part of daily life. People open social media during breaks,

before sleep, while travelling, or when they do not have a clear task. A short visit can easily turn into a long browsing session. Users move from one post to another, watch several short videos, read comments,

check messages, and follow links to new topics. This process often continues without a clear ending. Even when users feel tired, they may still keep scrolling. Continuous browsing is different from using social media for a specific purpose. A person who opens an app to reply to a message may finish the task in a few minutes. Continuous browsing has no fixed target. The user keeps receiving new content and decides whether to watch, skip, like, save, share, or comment. Each action seems simple, but the mind must process many small pieces of information in a short period. The user also needs to shift attention between images, words, sounds, opinions, and emotional reactions. These repeated mental activities can slowly produce cognitive fatigue.

Cognitive fatigue is not the same as feeling sleepy or physically tired. Short-term tiredness may appear after a difficult task and may disappear after a brief rest. Cognitive fatigue is linked to the continued use of attention, working memory, judgment, and self-control (Boksem & Tops, 2008). A person may still be awake and physically active but find it hard to think clearly. Common signs include poor concentration, slow judgment, impatience, weak memory, and difficulty returning to study or work (Boksem et al., 2005). Some users also feel mentally empty after browsing, even though they have seen a large amount of content.

Social media can create this form of fatigue because its content changes quickly. A user may see a personal story, a news report, an advertisement, a funny video, and an angry comment within one minute. These items may have no clear link. The mind must leave one topic and enter another before the earlier information has been fully understood. Part of the earlier content may remain active in memory. At the same time, new information continues to arrive. This creates pressure on limited mental resources.

The design of social media also makes stopping difficult. Infinite scrolling removes clear stopping points. Autoplay starts the next video without asking the user to make a full choice. Notifications and recommendation systems bring attention back to the platform. The next post may be interesting,

useful, funny, or surprising, but the user cannot know in advance. This uncertainty creates an expectation of reward and encourages continued scrolling. The user may keep browsing in search of something more satisfying, even when most of the content no longer feels enjoyable.

Emotional content adds another mental demand. Social media feeds often mix humour, fear, anger, sadness, admiration, and envy. Users may laugh at one video and feel worried about the next post. They may compare their appearance, study results, work progress, or lifestyle with other people. They may also enter arguments in comment sections or react to public events. Each emotional change requires mental adjustment. Strong emotions can hold attention for a short time, but repeated emotional shifts may leave the user tense and mentally tired.

Continuous browsing also uses self-control. Users need to decide whether to ignore a notification, stop watching, leave a comment, or close the app. During a long session, this control may become weaker. A tired user is more likely to choose easy and stimulating content. Such content requires less careful thought and gives a faster emotional response. The person may then continue browsing because returning to a demanding task feels difficult. Fatigue does not always lead to stopping. It may reduce the ability to stop.

The experience can form a repeated cycle. New content attracts attention. Rapid switching increases mental load. Too much information weakens concentration and judgment. Weaker control makes it harder to leave the platform. The session becomes longer, and the level of fatigue rises. When the user finally stops, attention may remain scattered. Reading, writing, problem-solving, or face-to-face communication may require more effort than before the browsing session.

2. Cognitive Demands in Continuous Browsing

Social media browsing often looks like an easy activity. Users sit still, move a finger across the screen, and receive content without much physical effort. This simple appearance can hide the amount of mental work involved. During one browsing

session, the user may read short texts, watch videos, listen to speech, recognize faces, judge opinions, and react to comments. These tasks happen quickly and often overlap.

Each post asks the mind to identify what the content is about. The user needs to decide whether it is useful, interesting, trustworthy, or worth further attention. The next post may require a different type of response. A news item may call for careful reading. A joke may need social or cultural knowledge. A personal story may produce sympathy. An advertisement may ask the user to compare products or judge a sales claim. The mind keeps changing its way of processing information.

This type of browsing does not always involve deep thought, but it still uses attention, memory, judgment, and emotional control. The mental cost of one post may be small. The cost becomes more noticeable when hundreds of posts appear in one session (Dhir et al., 2018, 2019). Rapid content switching, high information density, and constant novelty place repeated demands on limited cognitive resources.

2.1 Rapid Content Switching

A social media feed can place many unrelated topics next to each other. A user may watch a video about a public event, scroll to a cooking clip, read a personal complaint, see a product advertisement, and then enter a discussion about education. These topics do not form a clear sequence. Each new item asks the mind to leave the earlier topic and build a basic understanding of the next one.

This change is not always immediate. Part of the earlier content may remain active for a short time. A strong image, an emotional statement, or an unfinished question can stay in the user's mind after the next post appears. The user may already be watching a new video while still thinking about the earlier one. This remaining mental activity makes it harder to give full attention to the current content.

Attention switching also requires the user to adjust to different forms of information. Reading a paragraph needs a different pace from watching a short video. A video combines movement, music,

speech, captions, and visual effects. A comment section may contain short replies, jokes, arguments, symbols, and incomplete sentences. Moving between these forms forces the user to change how attention is directed.

The speed of the feed leaves little time for this adjustment. Many users decide within seconds whether to stay or scroll away. The mind must quickly identify the topic and estimate its value. If the content does not produce interest at once, the user moves to the next item. This pattern trains attention to respond to brief and strong signals. Titles, facial expressions, music, emotional words, and surprising images become important because they help the user make a fast choice.

Repeated switching can weaken stable focus. Stable focus requires time to enter a topic, connect new information with earlier knowledge, and form a clear understanding. Continuous browsing interrupts this process. The user often leaves before the information has been fully processed. A post may be remembered as a feeling, a phrase, or an image, but its full meaning is lost.

This pattern can also affect the user after leaving the platform. A study task or a long article may feel slow because it does not provide constant changes. The person may read a few lines and feel an urge to check the phone. Attention has become used to short cycles. A task that requires ten or twenty minutes of steady focus may now feel more difficult (Ophir et al., 2009; Uncapher & Wagner, 2018).

Rapid switching can create the feeling of being busy without producing clear knowledge. The user has seen many topics and may feel informed, but only a small part of the content has been understood in depth. The mind has spent energy entering and leaving topics rather than building a stable line of thought (Monsell, 2003). This repeated adjustment is a major source of fatigue during long browsing sessions.

2.2 High Information Density

Social media places a large amount of information within a small space and a short period. A single screen may contain a video, captions, user names,

reaction counts, comments, links, labels, and advertisements. Some posts include several images, background music, spoken language, and written text at the same time. The user needs to select which part deserves attention.

The amount of available information is often greater than the amount the mind can process. Human working memory can hold only a limited amount of material at one time (Cowan, 2001). When new information arrives too quickly, earlier details are pushed out before they have been organized (Cowan, 2001; Sweller, 1988). The user may remember seeing a post but may not remember who posted it, what evidence it used, or how its main point was supported.

The problem is not only the number of posts. Each post may contain several layers of information. A short video may show a person speaking while captions appear at the bottom of the screen. Music plays in the background. Images change quickly. Comments appear beside or below the video. The user may also notice the number of likes and shares. All these signals compete for attention.

The user may try to process several signals together. This creates pressure on working memory. Spoken words need to be connected with images. Captions need to be checked against speech. Comments may change the meaning of the video or question its truth. The user must keep parts of the original content in mind while reading other people's reactions. If the discussion is complex, the mental load rises quickly.

Limited viewing time makes this problem stronger. Users often scroll before they have understood the full meaning of a post. They may read only the title, watch part of a video, or look at the top comments. The mind receives incomplete pieces of information. It then tries to fill in the missing parts through guesswork, earlier beliefs, or emotional cues.

This can lead to shallow processing. Shallow processing helps the user move through content quickly, but it produces weak memory. The user notices the general topic without examining details. Strong words and images may remain in memory, while explanations and conditions disappear. A post

may be remembered as positive, negative, shocking, or funny, but the reason for that reaction becomes unclear.

Information density also makes selection difficult. The user cannot give equal attention to every element on the screen. Some details must be ignored. This selection itself requires mental effort. The user needs to choose whether to follow the speaker, read the captions, open the comments, or check the source. These choices happen repeatedly and often without conscious planning.

When the feed contains many similar posts, confusion may appear. Users may mix up names, events, opinions, or sources. They may remember a claim but forget where it came from. They may also treat repeated information as reliable simply because it has appeared many times. The large amount of content creates familiarity, but familiarity is not the same as careful understanding.

The pressure on working memory becomes stronger during long sessions. Early in the session, the user may still compare sources and remember details. Later, the same person may rely more on titles, images, and emotional reactions. The mind reduces effort because its processing capacity has been used for a long time. This change may happen before the user clearly notices feeling tired.

2.3 Constant Novelty

Every scroll can bring a new image, topic, person, sound, or opinion. This constant novelty is one reason social media can hold attention for a long time. The user does not know what will appear next (Berridge & Robinson, 1998; Fiorillo et al., 2003). The next post may be more useful, more entertaining, or more surprising than the current one. This possibility encourages continued browsing.

Novel information attracts attention because it may contain something important. The mind is naturally sensitive to change. A new sound, face, or movement can quickly pull attention away from what came before. Social media feeds use this response by presenting new material every few seconds. Bright images, sudden cuts, strong

emotions, and unexpected claims make the change more noticeable.

Novelty does not need to provide lasting satisfaction. It only needs to create enough interest for the user to remain on the platform. A post may hold attention for a few seconds and then lose its value. The user scrolls again and receives another chance of finding something better. This process can continue for a long time because each new item renews expectation.

The reward is uncertain. Some posts are boring, while others are highly interesting. The user cannot predict which one will appear next. This uncertainty can make browsing harder to stop. Leaving the platform means giving up the chance of seeing a rewarding post. The next scroll feels small and harmless, so the user continues.

Constant novelty also changes the user's standard for stimulation. After seeing many fast and emotional posts, ordinary content may feel weak. A calm explanation, a long article, or a simple daily task may not create the same level of interest. The user may become impatient when information is presented slowly. This does not always mean that the user has lost the ability to focus. It may mean that attention is still adjusted to the high level of stimulation in the feed.

The search for novelty can continue even when the user no longer enjoys browsing. The person may notice boredom, eye strain, or mental tiredness but still keep scrolling. At this stage, browsing is driven less by interest and more by the expectation that the next post may be better. The user may skip content faster and spend less time on each item.

Faster scrolling increases the number of attention shifts. It also gives the mind less time to process each post. The user receives more content but gains less meaning from it. This can produce a strange state in which the person feels both overstimulated and bored. There is too much information, but little of it feels satisfying.

The lack of clear stopping points supports this pattern. A book has chapters, a television programme has an ending, and a newspaper has a final page. An endless feed does not provide the

same signal. The user must create the stopping point through self-control. Constant novelty makes this decision harder because each new post offers another possible reward.

Users may also slow down only when they meet highly emotional or personally relevant content. This means calm and detailed material is often passed over, while anger, fear, conflict, beauty, and surprise receive more attention. The feed becomes a stream of strong signals. The mind stays alert because it keeps meeting content that appears urgent or important, even when the information has little direct value for the user's life.

3. Attention Fragmentation

Attention fragmentation refers to a state in which attention is divided into many short and disconnected periods. During continuous social media browsing, users rarely stay with one piece of content for long. They move between posts, videos, comments, messages, and notifications. Attention is repeatedly pulled away before a stable focus has formed.

This form of attention is different from the focus used in reading, writing, or solving a problem. A difficult task usually requires the person to remain with the same topic, keep earlier information in mind, and connect each new detail with what has already been understood. Social media browsing often breaks this process into small parts. Each post creates a brief focus, but the focus ends when the user scrolls to the next item.

Fragmented attention does not mean that the user is paying no attention. The user may be highly alert to new sounds, images, movements, and emotional words. The problem is that attention is spread across too many targets. It becomes fast and reactive but less stable. This pattern can increase mental effort because the mind must keep rebuilding focus.

3.1 Short Attention Cycles

A short attention cycle begins when a new post catches the user's interest and ends when the user scrolls away. On social media, this cycle may last only a few seconds. The user looks at an image,

reads part of a caption, or watches the opening of a video. If the content does not create quick interest, it is left behind.

Many posts are designed to gain attention at once. They use strong titles, rapid movement, close-up faces, loud sounds, short captions, and emotional language. These features help the user understand the basic message without spending much time. They also encourage users to expect immediate stimulation from every item.

The user soon develops a habit of making very fast judgments. A post is treated as interesting or boring, useful or useless, believable or doubtful within a short period. This judgment may be based on the first image, the opening sentence, or the number of likes. There is little time to examine the full message. Short attention cycles reduce the chance of deep processing. Understanding a complex idea takes time. The reader needs to identify the main point, examine the supporting details, compare the idea with earlier knowledge, and consider whether the claim is reasonable. When attention lasts only a few seconds, most of these steps do not take place.

The user may still remember parts of the content. A face, phrase, headline, or emotional reaction can remain in memory. Yet these pieces are often separated from their original context. The person may remember that a topic seemed alarming but forget the details that caused this reaction. The memory contains the emotional signal but not the full explanation.

Repeated short cycles can change what the user expects from information (Uncapher & Wagner, 2018). Content that gives a quick response begins to feel easier. Slow content requires patience and may seem harder than it did before the browsing session. A long paragraph has no sudden visual change. A lecture may stay on one idea for several minutes. A work task may offer no immediate reward. These activities can feel dull when attention has become used to rapid changes.

This effect is often clear when users try to return to study or work. They may open a document, read several lines, and then check the phone. The task itself may not be unusually difficult. The mind is still

expecting a new stimulus after a short period. When no change appears, the person feels restless.

The phone can then become an easy way to escape this feeling. A brief check provides new content at once. The user returns to the task after a few minutes, but stable attention has been broken again. Repeating this pattern makes it harder to enter a longer period of concentration.

Short attention cycles can also reduce tolerance for uncertainty. Difficult material does not always make sense at once. The reader may need to stay with a confusing sentence or return to an earlier point. Social media offers a simple alternative: leave the current item and find another one. Frequent use of this option may make it harder to remain with material that requires effort before it becomes clear. Dependence on fast stimulation does not always appear as strong excitement. It can appear as impatience. The person may feel uncomfortable when a page loads slowly, when a speaker pauses, or when a video takes too long to reach its point. The mind has adjusted to a pace in which new information arrives every few seconds.

This pattern can continue even when users know that their attention is weak. They may try to read longer content but keep scanning for key words. They may watch a video at a higher speed or skip through sections. These actions save time, but they can also reduce understanding. The person receives the main outline without processing the reasoning behind it.

3.2 Frequent Attentional Shifts

Continuous browsing involves more than moving from one post to another. Attention also shifts between the main feed, comment sections, private messages, notifications, advertisements, and external links. A user may start by watching a video, notice a message at the top of the screen, reply to it, read a comment, open another user's profile, and then return to the feed.

Each shift requires a small mental adjustment. The user must identify the new task, recall what needs to be done, and decide how to respond. When returning to the earlier content, the person must

remember where attention was interrupted. This takes time even when the interruption is brief.

The cost of one shift may not be noticeable. The cost grows when the same process happens many times. Part of the mind remains connected to the earlier task after attention has moved elsewhere. A user who leaves a video to answer a message may continue thinking about the message after returning to the video. The content is playing, but attention has not fully returned.

Notifications increase this problem because they appear without waiting for the current activity to end. A sound, vibration, number, or banner signals that something new may need attention. The user may ignore it, but ignoring it still requires a decision. The person may also keep thinking about who sent the message or what the notification contains.

A notification does not need to be opened to break focus (Stothart et al., 2015). Its appearance can create curiosity or concern. The user may try to continue watching the current post while holding the notification in mind. Attention is then divided between the present content and the possible meaning of the new signal.

Comment sections create another type of shift. The user moves from receiving the original content to judging other people's reactions. Comments may support, challenge, mock, or change the meaning of the post. The user must compare these responses with the original message. This can improve understanding in some cases, but it also adds more voices and more information to process.

A comment may lead to another profile, another discussion, or another topic. The browsing path becomes less direct. The user may forget why a comment section was opened or what the original post was about. Attention is guided by each new link rather than by a clear goal.

Private messages can create stronger interruptions because they call for a personal response. The user stops observing content and enters a social exchange. This requires recalling the relationship, reading the tone, choosing words, and thinking about how the other person may react. After sending

the reply, the user returns to passive browsing. The mind has to change its mode again.

Repeated shifts lower processing efficiency. More mental effort is used to enter and leave activities. Less effort remains for understanding the content itself. The user may spend a long time on the platform but remember little of what was viewed.

Frequent shifts can also create mistakes. A user may misread a message, reply too quickly, or confuse one discussion with another. Important details may be missed because attention was divided. The person may need to reread content, which adds more mental work.

The speed of switching can give users a feeling of control. They seem able to handle messages, videos, comments, and news at the same time. Yet these activities are usually processed in rapid order rather than at the same moment. Each change has a mental cost. The cost is hidden because the actions feel familiar and take only a few seconds.

This pattern can remain after the browsing session ends. The person may switch between work tabs, check messages during reading, or stop a task whenever a new thought appears. Attention has become used to responding to interruptions. Staying with one activity may then require more active control.

3.3 Weak Recovery of Attention

Attention needs periods of lower demand to recover. After a difficult task, a short pause can allow mental activity to slow down. The person may look away from the screen, sit quietly, walk, or focus on the physical surroundings. These pauses give the mind time to release earlier information and prepare for the next task.

Continuous browsing often replaces this kind of rest. Many users open social media when they feel tired, bored, or stressed. The activity is treated as a break because it does not look like formal work. Yet the feed continues to ask for attention. New images, sounds, words, and social signals appear without pause.

A person may stop studying but continue using the same mental resources on social media. Attention

still needs to select information. Working memory still holds small pieces of content. Judgment is still used to decide what to watch or skip. Emotional control is still needed when the feed shows conflict, bad news, or social comparison.

The body may be resting while the mind remains active (Boksem & Tops, 2008). This can explain why a long browsing break does not always make the person feel refreshed. The user may return to work with less patience and weaker concentration than before. The break has changed the type of mental activity, but it has not reduced the total demand.

Quiet moments are rare inside an endless feed. When one post ends, another begins. When a video becomes boring, the user scrolls rather than stopping. Empty time is quickly filled with new content. Even loading periods are often covered by movement, music, or suggested posts.

The lack of quiet pauses prevents earlier stimulation from fading. Images, phrases, sounds, and emotions remain active while new material arrives. The mind has little time to organize or release them. This can create a feeling of mental crowding. The user has many impressions but no clear line of thought.

Autoplay makes recovery more difficult because it removes the small pause between videos. Without autoplay, the end of a video could serve as a natural point for the user to decide whether to continue. When the next item begins at once, attention is captured again before that decision is made.

Infinite scrolling has a similar effect. There is no final page that tells the user the activity is complete. The feed can continue for as long as the user is willing to stay. The absence of an ending weakens the chance of taking a real break.

Users may also switch between several platforms when one feed becomes less interesting. Instead of putting the phone down, they open another app. The content changes, but mental stimulation continues. This behaviour can hide fatigue because novelty briefly raises alertness. The person feels more awake for a short time, even though the need for rest remains.

Weak recovery can produce a delayed form of fatigue. During browsing, the user may not feel very

tired because new content keeps attracting attention. The fatigue becomes clearer after the phone is put down. The person may feel empty, unfocused, irritable, or unable to begin another task.

Sleep can also be affected when browsing fills the period before bed. The mind continues to receive emotional and visual signals at a time that would otherwise allow activity to slow down. A user may stop browsing only when already very tired. The transition from high stimulation to sleep then happens without a calm period.

Attention recovery requires more than leaving work. It requires a real reduction in mental input. Continuous social media browsing often appears to offer rest while keeping attention active. The user leaves one demanding activity but enters another stream of choices, changes, and reactions.

4. Working Memory Overload

Working memory allows people to hold and use a small amount of information for a short time (Cowan, 2001). It supports reading, understanding, comparison, judgment, and decision-making. When a person reads a sentence, working memory keeps the earlier words active until the full meaning becomes clear. When a person compares two opinions, it holds parts of both views long enough to notice their differences.

Continuous social media browsing places repeated pressure on this system. Every post brings new words, images, sounds, names, claims, and reactions. The user may try to remember the main point of a video while reading comments below it. A new notification may appear before this process is complete. The user then moves to another topic while parts of the earlier content are still active.

Working memory has a limited capacity. It cannot keep every item that appears in a long feed. New information quickly replaces earlier information. The user may remember the general feeling of a browsing session but forget most of the details. This does not mean that the person paid no attention. It often means that the amount and speed of incoming information exceeded the space available for active processing.

4.1 Temporary Storage of Multiple Messages

A social media post rarely contains only one message. A video may include spoken words, captions, background music, visual scenes, and text added by the creator. The user may also see a title, a user name, reaction counts, and several comments. Each part adds something to the meaning of the post.

To understand the content, the user needs to hold some of these details in mind at the same time. The spoken words may explain the images. The caption may add information that is not included in the speech. A comment may question whether the video is true. The user must keep the original claim active while reading the response.

This process uses working memory even when the content is short. A user may need to remember who made a claim, what happened, when it happened, and why other users disagree. If the person opens another link for more information, the earlier details must remain active during the change. Too many details can cause some parts to disappear before the comparison is complete.

Images also take up mental space. A strong image may stay active after the user has moved to another post. A face, product, location, or scene can remain in mind while new visual material appears. When many images are viewed in a short period, they may begin to mix together. The user may remember seeing a picture but forget which post it belonged to. Opinions create a similar burden. Comment sections often contain many short and conflicting views. One user supports the post, another rejects it, and a third adds a different explanation. The reader may try to compare these opinions with the original message. This requires keeping several positions active at once.

The task becomes harder when comments use sarcasm, jokes, indirect language, or references to earlier events. The user has to work out what each person means before deciding whether the comment supports or attacks the post. The meaning may not be clear from the words alone.

Personal reactions also occupy working memory. A post may remind the user of a past event, a friend, a

personal worry, or an unfinished task. The person is no longer processing only the information on the screen. Earlier memories and private concerns are also active. This leaves less space for the next item.

The feed does not wait for working memory to clear. New content appears as soon as the user scrolls. Earlier information may still be partly active, but another set of details now needs attention. The mind must either remove the earlier material or hold several unrelated items together.

In many cases, earlier information is lost quickly. A user may finish a long session and struggle to name more than a few posts. Titles, sources, and explanations are often forgotten. Emotional parts may remain because they received stronger attention, but factual details disappear.

This quick loss can create repeated checking. The user may return to a post because a name or fact has been forgotten. The person may replay a video, open the comments again, or search for the original source. Rechecking adds more information to the same limited system.

Working memory pressure also affects judgment. When the user cannot hold enough details, simple signals become more important. The number of likes, the confidence of the speaker, the emotional tone, or the top comment may guide the response. These signals are easy to notice and remember, but they do not always show whether the information is accurate.

The user may feel that a claim is familiar because similar messages appeared earlier in the feed. Yet the person may not remember the sources or the exact wording. Familiarity can then be mistaken for knowledge. The content seems known, even though only a weak trace remains.

4.2 Incomplete Information Processing

Understanding information takes more than seeing or hearing it. The mind needs time to identify the main idea, connect details, compare the message with earlier knowledge, and judge whether it makes sense. Continuous browsing often cuts this process short.

Users frequently leave a post before its full meaning is clear. They may read only the headline, watch the opening part of a video, or scan the first few comments. The post has entered working memory, but it has not been fully processed. The user moves on with only a partial impression (Sweller, 1988).

The opening of social media content is often designed to create immediate interest. A title may use surprise, conflict, fear, or a strong promise. The full content may later add limits or explanations, but many users do not stay long enough to reach them. The first impression remains active while the missing details are never received.

This creates shallow encoding. Information enters memory at a basic level but is not linked to a wider structure (Cowan, 2001; Sweller, 1988). The user may remember a key phrase or a striking image without understanding how the claim was formed. The information is easy to recognize later but difficult to explain.

A person may see the same topic several times and feel well informed. Each post adds another short piece, but the pieces may not fit together. Some posts repeat the same claim. Others use different facts or give opposite views. Without enough time for comparison, the user collects fragments rather than a clear account.

Similar messages are especially easy to confuse. Social media often presents several posts about the same event, public figure, product, or social issue. The wording and images may be close. After continuous viewing, the user may attach a detail from one post to another.

Source memory can also become weak. The person remembers the claim but not where it appeared. A statement from an expert, an advertisement, a personal account, and an unverified comment may all remain as similar memory traces. Once the source is lost, it becomes harder to judge the value of the information.

Short videos can increase this problem because they compress information. Complex events are presented in a brief form. Important background may be removed to keep the video fast and clear.

The user receives a simple story but not the conditions needed to judge it.

Comments may fill some gaps, but they can also create new confusion. A highly rated comment may offer a correction, a joke, or another unsupported claim. Users may treat it as part of the original information. The line between the post and the reactions below it becomes less clear.

Incomplete processing is not always caused by lack of interest. It may result from the structure of the feed. The user knows that more content is waiting. Staying with one post means giving up the chance to see other items. This creates pressure to move on before understanding is complete.

The speed of browsing can also reduce the chance to question a claim. Careful judgment needs a pause. The user may need to ask who created the content, what evidence is given, and whether another explanation is possible. The next post arrives before these questions are formed.

When working memory is under pressure, the mind often chooses the simplest meaning available. A complex issue may be reduced to a clear emotional judgment. A person is seen as right or wrong. An event is treated as good or bad. A product is viewed as useful or useless. Simple judgments require less mental effort than holding uncertain or mixed information.

Incomplete processing can affect later recall. The user may remember a conclusion without remembering the steps that led to it. When asked to explain the issue, the person may repeat a phrase from the feed but cannot provide details. The memory feels clear because the emotional direction is strong, even though its factual base is weak.

4.3 Cognitive Residue

Cognitive residue refers to mental activity that remains after attention has moved away from a task or topic (Leroy, 2009). A person may leave a post, but thoughts, images, or emotions linked to it can stay active. The next item then receives only part of the user's attention.

Some content leaves more residue than other content. A disturbing news story may create worry.

A personal post may lead to social comparison. An argument may make the user angry. A surprising claim may create questions that have not been answered. These reactions do not disappear at the moment of scrolling.

The user may continue thinking about an earlier post while watching a new video. The eyes follow the new content, but part of the mind remains with the earlier topic. This division weakens understanding of the current item. The user may need to replay the video or reread the caption because attention was not fully available.

Unfinished content can leave strong residue. A user may stop watching before the end of a video or leave a discussion without finding a clear answer. The mind keeps the unfinished issue active because it has not reached a settled point. This can produce a quiet urge to return and check again.

Emotional content may remain active for longer. Anger, fear, embarrassment, and envy can continue after the original post has disappeared from the screen. The user may connect later content with the same emotion. A neutral post may then be viewed through the mood created by the earlier one.

Positive content can also leave residue. A funny video, an attractive product, or an idealized lifestyle may stay in mind. The user may imagine buying the product, visiting the place, or living in the same way. These thoughts use working memory while other information continues to arrive.

Rapid scrolling allows little time for residue to fade. Each post adds another possible thought or feeling. The user may carry parts of several earlier items at once. These traces compete with the content currently on the screen.

The mental burden grows when the browsing session contains many unrelated topics. The person may carry worry from a news story, interest in a product, irritation from a comment, and concern about a friend's post. None of these reactions is fully processed before the next topic begins.

Cognitive residue can also come from social action. After writing a comment, the user may wonder how other people will respond. After sending a message, the person may wait for a reply. After posting

content, the user may think about likes, views, or possible criticism. Attention remains linked to the platform even when the screen shows something else.

The user may repeatedly check for updates because the earlier action still feels unfinished. Each check creates a new interruption and adds more content. The person then carries both the original concern and the new information into the next activity.

This residue does not always feel like a clear thought. It may appear as general restlessness, tension, or difficulty concentrating. The user knows that attention is weak but cannot identify which earlier post is still affecting it. Many small traces have blended into a broad sense of mental pressure. After leaving social media, residue can enter study, work, or conversation. A user may sit down to read but continue thinking about an online argument. The person may try to write while waiting for a reply. The earlier browsing session remains mentally active even though the phone is no longer being used.

Trying to remove these thoughts also requires effort. The person may tell themselves not to think about the post or not to check the phone. This act of control uses more mental resources. When fatigue is already present, resisting the urge becomes harder.

Cognitive residue can build slowly across a long session. The burden does not come from one post alone. It comes from many incomplete thoughts and emotional reactions that have not had time to fade. Each new item enters a mind that is already partly occupied.

5. Decision Fatigue During Browsing

Decision fatigue refers to the decline in judgment and self-control after a person has made many choices. Social media browsing contains a large number of small choices. Most of them do not feel serious. A user decides whether to stop, scroll, open a comment section, reply to a message, follow a link, or watch another video. Each choice takes only a moment, but the number of choices can become very large during a long session.

Social media platforms present these choices without clear breaks. Every post asks the user to make another decision. Even doing nothing is a choice. The user must decide whether to ignore the post and move on. This process continues as long as the feed remains open.

The mental cost of these choices is easy to miss because they are simple and familiar. Users may not notice any clear pressure when they tap a button or move to the next post. The burden appears through repetition. After a long period of browsing, judgment may become faster but less careful. The user may rely more on habit, emotion, and immediate interest.

Decision fatigue also affects the ability to leave the platform. Stopping requires the user to reject the next possible reward and return to another activity. This choice becomes harder when mental control is already weak. The user may know that the session should end but still continue scrolling.

5.1 Repeated Small Choices

Each post in a social media feed creates several possible actions. The user can watch it, skip it, like it, save it, share it, comment on it, open the creator's profile, or read the replies below it. A single post may lead to several decisions before the user reaches the next one.

Watching a video also involves choices. The user decides whether to turn on the sound, read the captions, continue to the end, replay a section, or leave early. If the video includes a product, news item, or personal claim, the user may also decide whether to believe it or search for more information. These actions often happen quickly. The user may not describe them as decisions because they feel automatic. Yet the mind still needs to judge the available options. It must estimate whether the content is worth more time and whether a response is needed.

The same process occurs in comment sections. The user decides which comments to read, whether to open hidden replies, whether to agree with the top comment, and whether to join the discussion. A

comment may create another choice by linking to a profile, another post, or an outside source.

Social features make some choices more difficult. Liking a post can be seen as a public sign of support. Sharing it may affect how other people view the user. Writing a comment can invite agreement, criticism, or conflict. The user may spend time choosing words and predicting how other people will react.

A simple message can also require mental control. The user may receive a reply while watching a video. The person must decide whether to answer at once or continue browsing. If the message is answered, another choice follows: what tone to use, how much to say, and whether to continue the conversation.

The platform may also ask the user to choose between different types of content. A recommended post may seem useful but not enjoyable. A funny video may be enjoyable but unrelated to the reason the app was opened. The user keeps deciding whether to follow the current goal or accept the new distraction.

These choices use small amounts of attention and control. The cost of one choice is usually low. Hundreds of similar choices can still create mental strain (Frieese et al., 2019; Vohs et al., 2008). The user must keep judging, selecting, rejecting, and responding without a clear pause.

Repeated choices can become harder when the user is already tired. Early in the session, the person may check sources, read full captions, and think before commenting. Later, the same person may scroll faster, accept the first explanation, or react to the emotional tone of the post.

The user may also begin to avoid choices that require effort. Reading a long post, comparing two claims, or writing a careful reply may feel too demanding. Skipping, liking, or continuing to scroll is easier. The feed then becomes filled with quick reactions rather than thoughtful decisions.

Automatic behaviour can reduce the feeling of effort, but it does not remove the cognitive cost. The user may scroll with little awareness, yet the mind still responds to each change in image, sound, and

topic. Attention keeps deciding what deserves a few more seconds and what should be left behind.

Repeated small choices also make time harder to track. Each action seems too minor to mark the passing of time. Watching one more video or reading one more comment does not feel like a major decision. A long session is built from many choices that each appear harmless.

5.2 Uncertain Value of Content

Users often do not know whether a post will be useful before they open or watch it. A title may promise important information, but the content may provide little value. A short video may seem unimportant at the beginning but become useful later. This uncertainty makes the choice to stay or leave more difficult.

Social media content often uses titles and opening lines that create curiosity. The user is told that an important fact, answer, or surprise will appear later. Leaving early may mean missing the most useful part. The person keeps watching even when the current content is slow or repetitive.

The same problem appears when users search for practical information. A person may browse posts about study methods, health, work, travel, or products. Many posts look similar, but their quality is unclear. The user must judge which creator is reliable and which advice fits the situation.

This judgment may require more information than the post provides. The user may need to check the source, read comments, open another account, or compare several posts. Each step creates more choices. The search that began with a simple question can turn into a long browsing session.

The large amount of available content can make stopping feel risky. The user may think that a more useful post is only a few scrolls away. Leaving the platform means accepting that some valuable information may remain unseen.

Fear of missing important information can appear even when the user has no clear search goal. News, public discussions, trends, and updates continue to appear throughout the day. Users may feel that

stopping means falling behind or missing something that other people already know.

This fear does not need to be strong or fully conscious. It may appear as a small doubt: perhaps the next post is important. The user scrolls again to remove that doubt. The next post creates another question, so the session continues.

Recommendation systems can strengthen this uncertainty by mixing useful and less useful content. A feed may contain a practical guide, an advertisement, a personal story, a joke, and a news update. Because valuable items appear among ordinary posts, users have a reason to keep checking.

The user may also find it hard to judge value when content is entertaining. A post may not provide useful information, but it may improve mood for a short time. The person then needs to decide whether enjoyment alone is enough reason to continue.

This decision becomes harder when the user is avoiding another task. Social media offers immediate stimulation, while study or work may require effort. The user may describe the browsing as a short break or a search for useful information. The real value of the session remains unclear.

Uncertain value can lead to repeated checking and comparison. The user may save many posts for later because there is not enough time to examine them now. Saving reduces the fear of losing the content, but it also creates a large collection that may never be reviewed.

The act of saving can give the user a sense of progress. A useful post has been found and stored. Yet the information has not been fully processed or applied. The person continues searching for more material instead of stopping to use what has already been collected.

Comments can make value harder to judge. Some users praise the post, while others call it false or incomplete. The reader may stay longer to decide which side is more convincing. More comments often produce more doubt rather than a clear answer.

Uncertainty keeps attention active. The user cannot easily close the question because the value of the

content has not been settled. This open state encourages another click, another search, or another scroll.

5.3 Reduced Self-Control

Self-control helps users follow a goal, resist distraction, and stop an activity at the planned time. Continuous browsing uses this ability many times. The user must ignore irrelevant posts, resist notifications, avoid arguments, and decide when the session should end.

At the beginning of browsing, the person may have a clear limit. The user may plan to spend five minutes checking messages or watching a few videos. The limit becomes less important as new content appears. Each post creates another reason to stay.

After a long session, the user may find it harder to act on the decision to stop. The person knows that time has passed and may even feel tired. Still, closing the app requires an active break from the current flow. Continuing requires only another small movement of the finger.

This difference matters. Stopping leads to a change of activity. The user may need to begin studying, return to work, prepare for sleep, or complete a household task. These activities often require more effort than watching the next post. Continuing the feed becomes the easier choice.

Mental fatigue weakens careful control. The user may stop asking whether the content is useful or whether the session still has a purpose. Behaviour becomes guided by habit. The hand scrolls before the person has made a clear decision.

Users may also choose content that requires less thought. Short videos, simple jokes, attractive images, and emotional stories are easier to process than detailed explanations. When mental energy is low, these forms of content become more appealing. Easy content can keep the user on the platform without giving real satisfaction. The person may no longer feel interested, but leaving still feels harder than continuing. Boredom and fatigue exist at the same time.

The speed of scrolling may increase at this stage. The user gives each post less attention and searches for something that can restore interest. More posts are viewed, but fewer are remembered. The search for stimulation replaces the original purpose of browsing.

Negative feelings can also weaken control. A user who feels stressed, lonely, or worried may use the feed to avoid these feelings. Closing the app brings the person back to the uncomfortable situation. Continued browsing offers a temporary escape, even when it adds more fatigue.

Social interaction can create another reason to stay. The user may wait for a reply, a like, or a reaction to a comment. The platform remains open because something may happen at any moment. This waiting state makes it difficult to end the session.

Users may notice physical signs such as eye strain, neck discomfort, or sleepiness. They may also notice mental signs such as poor focus or irritation. These signals do not always lead to stopping. Acting on them still requires control, and that control may already be weak.

The user may set a new limit instead. The person decides to stop after one more video or one more check. This promise delays the difficult choice. When the next item ends, another interesting post is already present.

Reduced self-control can also affect behaviour outside the platform. After browsing, the user may choose easier tasks, delay difficult work, or switch activities more often. Starting a demanding task requires mental effort that is no longer fully available.

The person may return to social media soon after closing it. A small pause, a difficult sentence, or a moment of boredom can trigger another check. The earlier session has weakened attention and control, which makes the next session easier to begin.

6. Emotional Arousal and Cognitive Fatigue

Social media browsing is not only an information activity (Kramer et al., 2014). It is also an emotional activity. Users may feel amused, angry, worried, sad, excited, or jealous during one browsing session.

These feelings can appear within a few minutes because the feed places very different types of content together.

Emotional content often receives more attention than calm content. A strong facial expression, a personal conflict, a frightening event, or an exciting result can stop the user from scrolling. The person may watch the full video, read the comments, or search for more information. Emotional reactions keep attention on the content, but they also use mental energy.

The user needs to understand what happened, judge whether the content is true, and decide how to respond. The person may try to control anger, reduce worry, or avoid comparing themselves with others. These actions require attention and self-control. When emotional reactions happen many times during one session, the user may become mentally tense and tired.

Emotional fatigue does not always appear as a strong feeling. It may appear as irritation, low patience, weak focus, or a sense of mental heaviness. The user may continue scrolling because new content still attracts attention. The emotional cost becomes clearer after the session ends.

6.1 Rapid Emotional Changes

A social media feed can move quickly between very different emotions. A funny video may be followed by a report about an accident. A personal success story may appear before a post about illness, job loss, or family conflict. The next item may be an advertisement, a joke, or an angry public discussion. The user has little time to adjust between these emotional states. Laughter may stop when a sad story appears. Concern may be replaced by excitement when the next video begins. These changes happen before the earlier feeling has fully faded.

Every emotional change requires some mental adjustment. The user must identify the new situation and decide what kind of response fits it. A humorous post invites amusement. A warning message asks for caution. A conflict may create

anger or defensiveness. A personal story may call for sympathy.

The mind cannot always complete this adjustment before another post appears. Part of the earlier emotion may remain active. A user may still feel worried about a news story while watching a light video. The new content may reduce the feeling for a moment, but it may not remove it.

This overlap can create emotional confusion. The person may feel tense without knowing which post caused the feeling. Several small reactions have been added together. The user may describe the session as tiring even when no single post seemed very serious.

Rapid changes can keep the body and mind alert. Emotional content may increase heart rate, muscle tension, or physical restlessness. The user may sit still, but the body continues to respond to the images and words on the screen. A long period of this alert state can make relaxation difficult.

Short videos can make these changes more frequent. Each video may use music, facial expressions, captions, and quick editing to create an immediate feeling. The emotional message is often clear within the opening seconds. The user reacts before the full context is known.

The next video may use a completely different emotional tone. The user does not choose the change in advance. It is produced by the order of the feed. The mind must keep responding to emotional signals that have little connection with each other. Music can strengthen these reactions. Sad music can make an ordinary story feel more painful. Fast music can create excitement. Dramatic sound can make a claim appear urgent. Users may react to the emotional style before they examine the information itself.

Captions and titles can create a similar effect. Words such as “shocking,” “dangerous,” “unbelievable,” or “heartbreaking” tell the user how to feel before the content has been viewed. This can raise emotional tension and shape judgment.

The comment section may create another emotional change. A user may enjoy a post but become angry after reading hostile comments. A sad story may

become a public argument. A serious discussion may turn into jokes or personal attacks. The emotional meaning of the post changes as the user reads other people's reactions.

Rapid emotional movement can weaken careful thought. Strong feelings narrow attention. The user may focus on the most striking words or images and miss details that do not fit the current emotion. An angry user may notice criticism more quickly. A worried user may pay more attention to danger.

This pattern can continue after browsing stops. The user may close the app but remain restless or irritated. A small problem in daily life may then produce a stronger reaction because emotional tension is already present. The person may have less patience for study, work, or conversation.

Repeated emotional adjustment uses the same mental resources needed for concentration and judgment. When these resources are tired, the user may respond more quickly and think less carefully. The person may like, share, or comment under the influence of the current feeling.

6.2 Social Comparison

Social media gives users frequent access to other people's lives. They see photos of appearance, travel, relationships, study results, work success, exercise, food, and expensive products. Much of this content shows selected moments rather than ordinary daily life.

Users often know that posts are selected and edited. This knowledge does not fully prevent comparison (Vogel et al., 2014). Images and stories still provide visible standards. The user may compare their own body, income, grades, career, social life, or daily routine with what appears on the screen.

Comparison can begin without a clear decision. A user sees a friend's achievement and thinks about their own progress. A fitness video leads to thoughts about body shape. A travel post creates a sense that other people have more freedom. A relationship post may make the user question their own personal life.

Each comparison requires self-evaluation. The user thinks about where they stand and whether they are

doing well enough. This may bring pride or motivation, but it may also create doubt, shame, envy, or pressure.

The comparison is often unequal. The user compares their full daily life with another person's best moments (Verduyn et al., 2015; Vogel et al., 2014). Personal problems, failed attempts, debt, stress, and conflict may not appear in the post. The result looks complete even though much of the real situation is hidden.

Repeated exposure can make unusual lifestyles appear normal. Users may see many posts about high income, attractive appearance, fast career progress, or perfect relationships. Each post comes from a different person, but the feed places them together. The user may feel that everyone else is doing better.

This feeling can grow even when the person's own life has not changed. The standard has changed because the feed presents many strong examples in a short time. Ordinary progress may then feel too slow or too small.

Social comparison takes mental energy because users try to explain the difference between themselves and others. They may think about what they lack, what they should change, and how much effort would be needed. These thoughts can continue after the post is gone.

Appearance-related content can create especially frequent comparison. Users see edited faces, body shapes, clothing, skin, and exercise results. Filters, lighting, camera angles, and image editing may not be clear. The final image can look natural even when it has been carefully produced.

The user may respond by checking their own appearance, taking more photos, changing clothing, or searching for beauty and fitness advice. A short comparison can become a longer chain of browsing. Each new post gives another standard to consider.

Success-related content creates similar pressure. Posts about grades, jobs, promotions, business results, or personal discipline may lead users to question their own ability. The person may feel behind even when the situations are not comparable.

Age, family support, education, income, location, and opportunity can differ greatly between users. These differences are not always visible in a short post. The result is easy to see, while the conditions behind it remain unclear.

Lifestyle content may create a wider sense of dissatisfaction. A user sees clean homes, healthy meals, travel, hobbies, close friendships, and productive routines. The feed combines these separate examples into an image of an ideal life. No single person may live in this way all the time, but the user can still feel expected to meet the full standard.

Comparison can lead to repeated checking. Users may return to certain accounts to see new photos, results, or updates. The content may cause discomfort, but it also attracts attention because it relates to the user's own concerns.

The user may then try to improve how they appear online. Posting becomes another source of mental work. The person chooses photos, edits text, checks reactions, and watches the number of likes. Self-presentation and self-evaluation begin to support each other.

Low response levels can create doubt. The user may wonder why a post received fewer likes than expected. They may compare the result with another person's post. The platform turns social approval into visible numbers, which makes comparison simple and repeated.

The mental cost rises when users cannot leave the comparison behind. A post may remain in mind during study, work, exercise, or rest. The person may continue thinking about what needs to change. Attention is divided between the current task and the online standard.

6.3 Conflict and Negative Content

Social media contains arguments, criticism, public scandals, violent events, and hostile comments. This content often attracts attention because it appears urgent or socially important. Users may feel that they need to understand what happened or decide which side is right.

Conflict is easy to continue online (Brady et al., 2017). A post can lead to hundreds or thousands of comments. Users reply to each other, repeat claims, question motives, and attack personal traits. The discussion may remain active for hours or days.

Reading conflict places the user in a state of alertness. The person watches for threats, unfair claims, insults, or new evidence. Attention becomes focused on possible danger and disagreement. This can make it hard to relax.

Public events can create a strong sense of involvement even when the user has no direct connection to the event. Videos, images, and personal stories make the situation feel close. Repeated updates keep the issue active in the user's mind.

The user may check the platform many times to see whether new information has appeared. Each update can change the meaning of the earlier content. The person tries to remember previous claims and compare them with new ones.

Unclear information makes this task harder. Early reports may be incomplete. Different accounts may present opposite versions. Edited videos and short captions may remove important details. The user must judge the situation while the facts remain uncertain.

Uncertainty can increase worry and attention. The person may continue reading because the issue does not feel settled. More content is used to reduce doubt, but each new post may add another question. Hostile comments can affect users even when the attack is not directed at them. Insults, threats, and harsh language create a negative social setting. The reader may imagine being treated in the same way or may feel pressure to defend a person or group.

Personal attacks can also change how users express themselves. A person may spend more time checking a comment before posting it. The user may worry about misunderstanding, criticism, or public embarrassment. This self-monitoring requires attention and control.

Some users enter arguments to correct information or defend a view. Writing a reply requires the person to recall facts, choose words, and predict

possible reactions. After posting, the user may wait for responses and return to the discussion many times.

The argument can remain mentally active between checks. The user thinks of better replies, imagines what others may say, or feels angry about an earlier comment. The platform is no longer open, but the conflict still uses attention.

Negative content can also create repeated exposure to pain and danger. News about crime, illness, disaster, abuse, or death may appear several times in one session. The user may watch similar videos from different accounts. Repetition can deepen fear or sadness without adding much useful information.

The emotional cost may be stronger when the content includes clear images or personal stories. Visual details can remain in memory and return later without warning. The user may have trouble focusing on ordinary tasks because the images are still active.

Anger can briefly create energy and attention. The user feels ready to respond and may not notice fatigue at once. When the emotional state weakens, mental tiredness becomes more visible. The person may feel empty, impatient, or unable to continue another task.

Negative content can change how later posts are understood. After reading several hostile discussions, the user may expect more conflict. A neutral comment may seem rude. A simple disagreement may feel like a personal attack.

The user may also become more likely to notice negative information. Calm posts receive less attention, while criticism and danger stand out. The feed then appears more hostile than it may actually be.

Emotional stress uses resources that are also needed for memory, judgment, and self-control. A worried user may find it harder to remember details. An angry user may make quick decisions. A tense user may keep checking the platform even though the checking increases the tension.

7. Reward Expectation and Continuous Scrolling

Continuous scrolling is often supported by the expectation that the next post may be more interesting than the current one. Users do not know what will appear after the next movement of the finger. The new post may contain useful information, a funny video, a message from a familiar person, or a topic that matches a personal interest. This uncertainty gives users a reason to keep browsing.

The reward does not need to be large. A short laugh, a surprising fact, an attractive image, or a new comment can provide a small moment of satisfaction (Meshi et al., 2013; Sherman et al., 2016). Most posts may be ordinary, but an interesting post can appear at any time. Users keep scrolling because the next item may offer this kind of response.

This pattern creates a gap between the user's actual experience and the expected experience. The current content may no longer be enjoyable, but the possibility of better content remains. The person continues searching even when attention has become weak and fatigue has begun to appear.

The design of the feed makes this search easy to continue. The user does not need to enter a new page or make a clear plan. One small movement brings another post. The low effort of each action hides the length of the full session.

7.1 Unpredictable Rewards

A predictable activity tells the user what will happen next. A film follows a story, a book follows a chapter order, and a planned search follows a clear question. A social media feed does not work in the same way. The next item can be very different from the current one.

This uncertainty keeps attention active. The user cannot know whether the next post will be boring or highly interesting (Berridge & Robinson, 1998; Fiorillo et al., 2003). Each scroll becomes a small test. Most results may offer little value, but some produce a strong response.

An interesting post acts as a reward for continued browsing. It may make the user laugh, provide

useful advice, answer a question, or create a feeling of social connection. The user learns that scrolling can produce these positive moments, but the timing cannot be predicted.

Uncertain rewards can hold attention more strongly than rewards that appear at fixed times. When users know that every post will be similar, they can leave more easily. When the quality changes from post to post, they may continue to search for the next good item.

The reward can come from the content itself. A short video may be funny or moving. A news post may offer new information. A tutorial may solve a small problem. A personal story may match the user's own experience.

Social reactions also act as rewards (Meshi et al., 2013; Sherman et al., 2016). Users may receive likes, replies, new followers, or private messages. These signals show that other people have noticed them. A person who has posted a photo or comment may reopen the platform many times to check whether a new reaction has appeared.

The timing of these reactions is uncertain. A reply may come in a few seconds or several hours later. The user may check the platform even when no notification has appeared. Each check carries the possibility of receiving social approval or new contact.

Recommendation systems add another form of uncertainty. The feed often includes content based on earlier viewing, but it does not repeat the same type of post in a fixed order. Familiar topics are mixed with new ones. The user receives enough relevant content to stay interested, while unexpected items prevent the experience from becoming fully predictable.

The platform may show a very interesting post after several ordinary ones. This teaches the user that a weak part of the session may improve without warning. Boredom does not always lead to leaving. It may lead to faster scrolling in search of a stronger reward.

Users may also stay because an earlier reward created a high expectation. After seeing a very funny or useful post, the person may look for another item

with the same effect. Later posts may not provide it, but the search continues.

This process can become more active when the user feels bored, stressed, or lonely. The person may not have a clear goal. The feed offers a quick chance of changing the current feeling. Each scroll promises a possible emotional shift.

The reward often lasts for only a short time. A funny video may improve mood for several seconds. A new like may create brief satisfaction. Once the feeling fades, the user returns to the feed and searches for another response.

Short rewards can support long sessions because they do not fully satisfy the user. The person receives enough pleasure to continue, but not enough to feel that the activity is complete. There is always room for another interesting post.

The expectation of reward may become stronger than the reward itself. Users may feel excited when opening the app or pulling down to refresh the feed. The act of checking carries hope. The actual content may then feel less satisfying than expected.

This difference does not always stop browsing. The user may think that the next item will be better. A disappointing post is quickly removed from view, and another chance appears at once.

The ease of scrolling reduces the cost of continuing. The user does not need to decide whether to begin a new activity. The next item is already available. A very small action is enough to maintain the search.

7.2 Reduced Sensitivity to Ordinary Content

Long browsing sessions expose users to a high level of visual, emotional, and informational change. Videos move quickly. Music begins without warning. Titles use strong language. Images are selected to gain attention. New topics appear every few seconds.

After repeated exposure, ordinary content may feel less interesting. A calm image, a simple explanation, or a slow conversation provides less stimulation than the feed. The user may understand that the content is useful but still struggle to stay with it.

This does not mean that ordinary tasks have lost their value. The problem lies in the difference

between levels of stimulation. The mind has spent a long time responding to fast and changing signals. A quiet task asks for a different form of attention.

Users may then search for stronger material inside the feed. They scroll past ordinary posts and stop only when something is surprising, emotional, beautiful, frightening, or highly relevant. The standard for gaining attention becomes higher.

Creators often respond to this pattern by placing strong signals at the start of their content. They use quick cuts, large captions, dramatic questions, or emotional expressions. These features help a post compete with all the other items in the feed.

When many posts use the same methods, users become used to them. A style that once felt exciting may begin to feel normal. Stronger signals are then needed to produce the same level of interest.

This can lead to faster browsing. The user decides very quickly whether a post deserves attention. Content that does not create an immediate response is skipped before its meaning becomes clear.

Slow information becomes harder to tolerate. A detailed article may need several paragraphs before reaching its main point. A lecture may explain basic ideas before entering the central issue. A conversation may include pauses and repetition. These forms do not offer a new reward every few seconds.

The user may feel bored even when the material is important. Boredom appears because the pace is lower than the pace of the feed. The person may begin checking the phone to restore the missing stimulation.

Returning to study or work can be difficult after a long session. Reading asks the user to hold attention on the same topic. Writing requires the person to create ideas without receiving constant outside input. Problem-solving may involve periods in which no answer appears.

These tasks do not provide quick and certain rewards. Progress may be slow and hard to see. The user has to continue through confusion or low interest before reaching a useful result.

Social media offers a simpler response to discomfort. The user can open the app and receive

new content at once. Even an ordinary post provides more change than a difficult page of text.

This contrast can break work into short periods. The person reads for a few minutes, checks the phone, returns to the task, and checks again. Each interruption makes it harder to rebuild focus.

Ordinary social interaction may also feel slow. Face-to-face conversations do not allow the user to skip another person after a few seconds. Topics develop at a natural pace. The user must listen even when the conversation is not immediately exciting.

A person who is used to rapid content changes may feel impatient during quiet moments. Waiting in line, travelling, eating alone, or sitting before a meeting can feel empty. The phone is used to fill these short periods.

This reduces opportunities for mental rest. Moments that once allowed attention to slow down are replaced by more stimulation. The user receives less time to process earlier thoughts or notice the physical surroundings.

Reduced sensitivity can also affect enjoyment. Activities that once felt pleasant may seem too simple after a long browsing session. Listening to music without checking the screen, walking without taking photos, or reading for pleasure may require more patience.

The user may try to combine ordinary activities with social media. A video plays during meals. Messages are checked during a film. The feed is opened while talking to another person. Adding stimulation makes the activity feel easier, but it also divides attention.

A lower tolerance for ordinary content can deepen cognitive fatigue. The user keeps seeking strong stimulation to avoid boredom. Strong stimulation places more demands on attention. The person becomes tired but finds quiet activity difficult to accept.

7.3 The Gap Between Pleasure and Fatigue

Social media browsing often feels enjoyable at the beginning of a session. The user may have been working, studying, waiting, or dealing with stress. Opening the platform provides a quick change of

activity. New content creates interest with little effort.

The first few posts may produce real pleasure. The user sees familiar people, receives a message, watches a funny video, or finds useful information. Attention is fresh, and the content feels easy to process.

The experience can change as the session continues. Similar posts begin to repeat. The user becomes less interested but keeps scrolling. The pleasure from each item becomes weaker, while mental effort continues.

Fatigue may appear through small signs. The user reads the same caption twice, forgets what the previous video showed, or scrolls without looking carefully. The person may feel eye strain, restlessness, or irritation.

These signs do not always cause the session to end. The user may continue because browsing has become automatic. The hand moves before a clear decision is made. The next post begins before the person considers whether the activity is still enjoyable.

The user may also continue because stopping creates an uncomfortable gap. After many minutes of constant input, silence can feel empty. Closing the app removes the stream of images, sounds, and updates. The person may not know what to do next. Returning to another task can require more effort than continuing to scroll. Study, work, or household tasks demand a clear action. Browsing demands almost nothing beyond keeping the screen active.

At this stage, continued use may not be guided by pleasure (Berridge & Robinson, 1998). It is guided by habit, low effort, and the expectation that an interesting post may still appear. The person is no longer enjoying most of the content but has not found a strong reason to stop.

Users may scroll faster when pleasure falls. They spend less time on each post and search for something that can restore interest. This increases the amount of content entering attention and gives the mind even less time to process it.

The search may produce a brief reward. One funny or surprising post can make the session feel useful

again. The user stays because the feed has shown that pleasure can return without warning.

The reward soon fades, and fast scrolling begins again. The session moves between short moments of interest and longer periods of weak attention. Mental fatigue grows during both periods because the feed continues to demand selection and response.

Some users become aware of this gap while they are still browsing. They may think that the activity is boring or a waste of time. They may also notice that they are no longer learning or enjoying anything.

Awareness alone may not be enough to stop. The person needs to break an active habit and face the task or feeling that browsing has delayed. When self-control is weak, continuing remains easier.

Guilt can enter the experience. The user knows that more time has passed than planned. This thought creates stress, but the stress may lead to further browsing because the platform offers a quick way to avoid it.

The person may promise to stop after one more post. This decision reduces guilt for a moment because it creates the feeling of control. The next post then leads to another one.

Fatigue can also reduce the ability to judge whether the session is still pleasant. The user may follow the pattern without checking their own state. Attention is directed outward toward the feed rather than inward toward signs of tiredness.

When the session finally ends, the difference between expected pleasure and actual experience becomes clearer. The user may realize that little content was memorable. A long period of browsing has produced few lasting rewards.

The person may feel both tired and unsatisfied. The activity used time and mental energy but did not provide a clear sense of completion. This unfinished feeling can support another session later, since the expected reward still seems available.

8. Loss of Time Awareness

Time awareness helps people judge how long an activity has lasted and decide when to stop. This judgment is easier when an activity has a clear

beginning, a clear order, and a visible ending. Continuous social media browsing often lacks these signals. The feed keeps producing new content, and each post takes only a short time to view. Users may notice individual posts but fail to notice how these short periods add up (Baughan et al., 2022).

Attention is directed toward the screen rather than toward the passage of time. The user watches what appears next, reacts to a message, or enters a comment section. Time becomes less visible because the activity is divided into many small actions. Watching one more video does not seem important. Reading a few more comments also feels brief. A long browsing session can be formed from these small choices without any clear moment when the user decides to continue for a long time.

Loss of time awareness is closely linked to cognitive fatigue. Users may browse far longer than they planned. They may also miss the early signs of tiredness because new content keeps attention active. Fatigue becomes clear only after the phone is put down or when the user tries to begin another task.

8.1 Weak Natural Stopping Points

Many daily activities contain natural stopping points. A book has pages and chapters. A film has an ending. A class ends at a fixed time. These limits help people judge when an activity is complete. Social media feeds often remove this sense of completion.

Infinite scrolling allows new content to appear without a final page. When one post leaves the screen, another is already waiting. The user does not need to choose a new programme, open a new book, or begin another task. The same action can continue without interruption.

Short-video platforms create a similar pattern. One video ends, and the next begins at once. Autoplay removes the pause that might remind the user to stop. The end of one item no longer marks the end of the activity. It only marks the beginning of another item.

A natural pause gives users time to notice their own condition. They may check the clock, feel eye strain,

remember an unfinished task, or decide that they have seen enough. When the next post appears immediately, attention moves toward the new content before this self-check takes place.

The feed also has no clear measure of progress. A reader can see how many pages remain in a chapter. A viewer can see how much time remains in a film. Social media users usually do not know how much content is left because the feed has no fixed length. There is no final point to reach.

Without a visible end, users must create their own stopping point. This requires an active decision. The person has to close the app even though more content is available. Leaving may feel like interrupting an unfinished activity rather than completing it.

The problem is stronger when the user enters the platform without a clear goal. A person who opens an app to answer one message has a possible endpoint. Once the reply is sent, the task can end. Yet recommended posts, notifications, and new messages can quickly create other reasons to stay.

A user may open the platform for a specific purpose and then move into the main feed. The original task ends, but browsing continues. The change may happen without full awareness. The person no longer remembers why the app was opened.

Comments can weaken stopping points in another way. A post may end, but the discussion below it continues. Each comment may lead to a reply, another profile, or another post. The user follows these links and moves farther from the original task. Live updates also make the activity feel incomplete. New comments, messages, and posts can appear at any moment. The user may feel that leaving now means missing an update. This feeling is common during public events, online arguments, or active group discussions.

Time is harder to judge when the content changes often. The user does not remain with one activity long enough to notice its length. Ten videos may feel like ten separate short events rather than one long session. Each item seems too brief to count as a serious use of time.

The physical action of scrolling also provides little information about duration. The same movement is repeated again and again. There is no large change in effort that marks the passing of time. The body stays in a similar position while the screen keeps changing.

Users may depend on outside events to stop browsing. The battery becomes low, another person speaks to them, a class begins, or an alarm sounds. Without such an interruption, the session may continue beyond the planned limit.

Weak stopping points delay awareness of fatigue. The user may not notice tired eyes, poor concentration, or physical discomfort while the feed remains active. Novel content briefly renews attention and hides the decline in mental energy.

The signs become harder to ignore when the user reads the same sentence several times, forgets the previous post, or scrolls without understanding what appears. Even then, the person may not stop. The feed still has no clear ending, and the next post may seem easier than making a decision to leave.

8.2 Automatic Browsing

Automatic browsing occurs when users scroll without a clear purpose and with limited awareness of each action. The person may open the platform out of habit rather than because of a planned need. A moment of boredom, waiting, stress, or difficulty can trigger the action.

The process often begins before the user makes a clear decision. The hand reaches for the phone, unlocks the screen, and opens a familiar app. These actions have been repeated many times, so they require little thought.

Once the feed is open, scrolling may also become automatic. The user views a post for a few seconds and moves to the next one. The decision to continue is not examined each time. It follows the same familiar pattern.

Habit can reduce awareness of the original goal. A person may open the phone to check the time and then enter social media. Another user may begin by replying to a message and later find that twenty minutes have passed in the feed. The change from

purposeful use to aimless browsing is often hard to notice.

Automatic browsing is supported by simple and repeated movements. Scrolling, tapping, and swiping require little effort. The user does not need to plan the next step because the platform presents it directly.

The feed also reduces the need to search. Content is selected and placed before the user. The person can continue receiving information without deciding what topic to enter. This makes browsing easy even when attention and self-control are weak.

Users may remain active on the screen while becoming less aware of what they are seeing. They continue to scroll, but few posts receive full attention. Content passes through awareness without being understood or remembered.

This state can appear after a period of active interest. Early in the session, the user reacts to posts and reads comments carefully. Later, browsing becomes faster and less focused. The person continues the same behaviour even though the level of interest has fallen.

Automatic browsing is often guided by habit rather than pleasure. The user may feel bored by the feed but still avoid closing it. The movement itself has become familiar. Stopping requires more awareness than continuing.

The user may notice this only when an outside event breaks the pattern. A call arrives, the screen locks, or another person asks a question. The interruption brings attention back to the physical setting. The person may then realize that they have been scrolling without a clear purpose.

Automatic use can also appear during other activities. Users check the feed while eating, walking, watching television, attending a meeting, or talking with another person. Social media is added to the activity without a clear need.

This divided use lowers awareness of both activities. The user may not fully follow the conversation or remember the online content. Attention moves back and forth without staying long enough in either place.

Habitual checking can be triggered by small gaps. A page takes a few seconds to load. A teacher pauses. A work task becomes difficult. The user opens social media before deciding how to use the pause.

These short checks may grow into longer sessions because the feed has no clear endpoint. The original pause may end, but browsing continues. The user delays returning to the earlier task.

Automatic browsing can also serve as a way to avoid uncomfortable thoughts. A difficult task may create doubt. A quiet moment may bring worry or loneliness. Opening the feed fills attention before the feeling is fully noticed.

The user receives immediate content and does not need to think about the source of discomfort. This relief can strengthen the habit. The next time a similar feeling appears, the person may open the platform again.

The action becomes linked to many daily situations. Users browse when waking up, waiting, resting, eating, travelling, or preparing for sleep. The platform becomes the usual response to any empty period.

Frequent automatic use weakens time awareness because the start of the session is not clearly marked. The user may not remember exactly when browsing began. Without a conscious starting point, it is harder to judge how long the activity has lasted.

The person may also underestimate total use because each session feels small. Several short checks across the day can add up to a large amount of time. Users remember each check as brief and may not see them as part of the same pattern.

Automatic browsing keeps attention active without giving the user a clear sense of purpose or completion. Mental energy is used on content that may not be remembered, enjoyed, or connected to any real need.

8.3 Disrupted Rest

Rest allows attention, working memory, and emotional control to recover. It does not always require sleep. Quiet sitting, walking, looking at the surroundings, or doing a simple physical task can

lower mental demand. These periods give the mind time to release earlier information.

Social media often enters the parts of the day that once provided this kind of rest. Users browse during work breaks, between classes, while travelling, during meals, and before sleep. The body may stop working, but the mind continues to receive new input.

A browsing break can feel easy because it is different from study or work. The user is not solving a formal problem or producing an answer. Yet attention is still selecting information. Working memory is still processing images, captions, and comments. Emotions are still changing in response to the feed.

This means that the mental system does not fully slow down. The type of activity changes, but the demand continues. A person may return from a social media break without feeling rested.

Short breaks are especially easy to lose. A user plans to browse for several minutes and then return to work. Infinite feeds and automatic scrolling extend the session. The break becomes longer than planned and may reduce the time available for the original task.

The user then returns under greater pressure. Less time remains, and the task may now feel more urgent. Stress rises, while attention is already tired from browsing.

The loss of quiet time also limits the processing of earlier experiences. After a class, meeting, or difficult task, the mind may need a short period to organize what happened. Immediate browsing fills this period with unrelated information.

New content can push earlier material out of working memory. The user may remember less of the class, conversation, or task that came before the break. Important ideas have less time to become stable.

Browsing can also interrupt physical rest. Users may remain in an uncomfortable position, hold the phone close to the face, or keep the neck bent. The body is inactive but not fully relaxed. Eye movement and screen light add to the sense of strain.

Rest before sleep is often affected in the same way. The period before bed could help emotional and

mental activity slow down (Levenson et al., 2017.; Woods & Scott, 2016). Social media keeps the user connected to messages, news, videos, and social comparison.

The user may intend to watch a few posts before sleeping. The session continues because no natural ending appears. Bedtime is delayed, and the amount of sleep becomes shorter.

Emotional posts can keep the mind active after the screen is turned off. A conflict, frightening story, or personal comparison may remain in thought. The user lies in bed but continues to review what was seen.

Positive content can also delay sleep. A funny video leads to another video. A message starts a conversation. A product or travel post creates plans and imagined situations. The mind stays active because the content remains interesting.

Sleep may begin later, and the transition into sleep may feel less calm. The user may wake feeling tired even when the browsing session seemed relaxing at the time.

Social media can also enter the night through notifications. A sound or vibration may wake the user or create an urge to check the phone. Even a brief check exposes the person to light, information, and social signals.

Disrupted sleep makes cognitive fatigue stronger the next day. Attention is less stable, working memory is weaker, and self-control is reduced. These changes can make social media more attractive because it requires less effort than demanding work.

The user may then rely on browsing during the day to escape tiredness or boredom. The activity fills breaks again, which removes more chances for recovery. Evening browsing may also increase because the person feels too tired for other activities. Fatigue is often strongest after the session ends. During browsing, novelty keeps attention active. The user may not feel how tired they have become. When the phone is closed, the stimulation stops and the decline in mental energy becomes clear.

The person may feel slow, empty, irritable, or unable to focus. Beginning another task may seem difficult.

The user may need a real break after the break that social media was supposed to provide.

This delayed fatigue can make it hard to connect the feeling with browsing. The user may think that work, study, or lack of motivation caused the problem. The mental demand of the feed remains less visible because the activity looked passive.

When browsing repeatedly replaces quiet time, mental recovery becomes incomplete across the day. Attention moves from work to social media and back again without a low-demand period between them. Fatigue carries over from one activity to the next.

9. The Cycle of Cognitive Fatigue

Cognitive fatigue during social media browsing does not come from a single post or a single mental task (Boksem & Tops, 2008; Dhira et al., 2018, 2019). It forms through a repeated process. New content attracts attention, quick changes raise mental demand, and too much information fills working memory. As fatigue grows, attention and judgment become weaker. The user then depends more on simple, emotional, and fast content. This content is easy to receive, but it also keeps the browsing session active.

The cycle can begin even when the user plans to browse for only a short time. At the start of the session, attention is still fresh. New posts feel interesting, and the user can make quick choices without much difficulty. After repeated switching, the same activity begins to require more effort. The user may not notice the change because the feed keeps providing new stimulation.

Fatigue does not always make the person stop. It can have the opposite effect. A tired user may find it harder to leave the platform, choose another activity, or begin a demanding task. Continued scrolling becomes the easiest available action. The behaviour that caused fatigue is then used to deal with the tiredness and boredom created by the same behaviour.

9.1 From Stimulation to Overload

The cycle often begins with stimulation. Social media feeds contain movement, sound, emotional language, social updates, and unexpected information. These features gain attention quickly. A user who feels bored or tired may become more alert after opening the platform.

This rise in alertness can feel like renewed mental energy. The user sees a new message, a funny video, or a topic of personal interest. Attention becomes active, and the earlier feeling of boredom becomes weaker. The person may believe that browsing is helping them rest or recover.

The effect is often temporary. Each new post creates another demand. The user needs to identify the topic, understand the basic message, and decide whether to stay or move on. A post that creates interest may also lead to comments, links, profiles, or related videos.

The feed changes faster than many ordinary activities. A user may move from entertainment to news, from news to personal stories, and from personal stories to advertising within a short period. Each change requires the mind to reset its focus.

This repeated adjustment uses attention. The user must leave the earlier topic and enter the next one. Part of the earlier information may remain active. A strong image, unfinished idea, or emotional reaction can stay in mind while new content is already being processed.

The mind is then dealing with more than the current post. It may also be holding part of a previous message, a recent comment, a private concern, or an expected reply. These items compete for limited space in working memory.

New content continues to arrive before earlier material has been fully understood or removed. The user receives more information than can be clearly organized. Details begin to disappear quickly. Sources, names, and explanations are forgotten.

The person may still remember emotional parts of the feed. A frightening image, an angry comment, or an attractive lifestyle can remain active because it gained strong attention. Calm details are more likely to be lost.

Overload does not mean that the user stops processing all information. The mind often responds by reducing the depth of processing. The user reads titles instead of full posts, watches only the opening seconds of videos, and depends on the top comments to judge the content.

This change allows browsing to continue. It lowers the mental cost of each post, but it also reduces understanding. The user receives more fragments and forms fewer stable memories.

Faster scrolling can increase overload. When users become less satisfied with the feed, they may move through posts at a higher speed. They are searching for content that can restore interest. More posts then enter attention within the same period.

The user may view dozens of items without remembering their order. Topics blend together. A claim from one post may be linked to an image from another. Similar events may be confused.

Notifications add another layer of demand. A message or alert interrupts the feed and asks the user to change tasks. The person may answer the message, check another account, and then return to the earlier content. Each move places more information in working memory.

Emotional changes also increase the load. The user may move from amusement to worry and then to anger within a few minutes. Each feeling takes time to settle, but the feed rarely allows that time.

The person may feel active rather than tired during this stage. New content keeps attention awake. The user is responding, scrolling, and making decisions. The mental decline becomes visible through poor recall, impatience, and weaker understanding.

A user may reread a caption because the meaning was missed. The person may replay a video after forgetting the opening. They may open the comments but fail to follow the discussion. These signs show that mental processing is becoming less efficient.

The user may also lose track of the purpose of the session. An app was opened to answer a message, find information, or take a short break. After many content shifts, the original goal is no longer active in working memory.

Overload can create a feeling of mental fullness. The person has seen many things but cannot explain what was learned. Thoughts feel crowded, yet no single idea is clear. The feed has produced many reactions without giving enough time to organize them.

9.2 From Overload to Reduced Control

Cognitive overload lowers the quality of attention. The user may continue looking at the screen, but less attention is given to each item. Important details are missed, and the meaning of content is judged through quick signals.

Titles, images, music, and visible reaction counts become more influential. These features are easy to notice. They do not require the same level of effort as checking evidence, comparing sources, or reading a full discussion.

A tired user may accept the first clear explanation. Complex information becomes harder to hold in mind. A simple story with a clear good side and bad side is easier to process than an uncertain account with several possible causes.

This can weaken judgment. The user may treat popularity as a sign of truth. A post with many likes or shares may seem more reliable even when the source is unclear. The top comment may guide the user's view because reading the full discussion requires too much effort.

Emotional content also becomes more attractive. Anger, fear, humour, and surprise produce quick responses. The user does not need to spend much time deciding how the content feels. The emotional direction is already clear.

Calm and detailed posts may be skipped. They ask for patience and stable attention. A tired user is more likely to choose content that gives an immediate reaction.

Self-control also becomes weaker under overload. Closing the app requires a clear decision. The user must stop the current flow and move to another activity. This change may involve work, study, sleep, or a task that has already been delayed.

Continuing to scroll requires less effort. The next post is already available, and the movement is familiar. The user does not need to plan or prepare. A person may know that the session should end but delay the decision. The user tells themselves that they will stop after one more video or one more check. This promise reduces pressure for a short time.

The next post may create another reason to stay. It may contain an unfinished story, a useful tip, or a discussion that seems important. The stopping point is moved again.

Fatigue can also weaken awareness of personal goals. The user may have planned to finish an assignment or go to sleep at a fixed time. These goals feel less immediate than the content on the screen.

The feed is present and easy to follow. The delayed task is outside the screen and requires effort. The mind gives more weight to the immediate option.

Judgment can become more emotional during this stage. A user may share a post without checking it, write a quick reply, or enter an argument. The reaction feels reasonable in the moment because there is little mental space for careful review.

The person may later regret the action. The comment may appear too harsh, or the shared claim may turn out to be incomplete. The weaker decision was linked to fatigue rather than to a stable change in the user's values.

Reduced control can also appear through repeated checking. The user closes the app but opens it again after a few minutes. A pause in work, a difficult sentence, or a small feeling of boredom is enough to restart the habit.

The mind now expects quick stimulation. A demanding task feels even harder because it offers no immediate change. The user returns to the feed because it can fill attention without requiring much planning.

Simple content gives short relief from overload. The user does not need to remember much or solve a problem. A video can be watched without forming a clear goal. This relief makes the content attractive when mental energy is low.

The relief does not provide full recovery. Attention is still shifting, and new information is still entering working memory. Emotional reactions and small choices continue.

The user may feel less pressure for a few moments while becoming more tired over time. The platform is used to escape the discomfort caused by mental fatigue, but the same activity keeps the mental demand active.

9.3 From Reduced Control to Longer Browsing

Reduced control makes stopping more difficult. The user may notice fatigue but fail to act on it. Eye strain, poor focus, boredom, and irritation are present, yet continued scrolling still feels easier than closing the app.

A tired user often avoids tasks that require effort. Returning to work may mean reading a difficult text, solving a problem, or making an important decision. Preparing for sleep may require putting the phone away and accepting a quiet period.

The feed offers a simpler path. It supplies content without asking the user to create a plan. Each new item can be accepted or skipped within seconds.

The user may continue searching for a rewarding post. Earlier in the session, some content produced real pleasure. A funny video, useful idea, or social response created a positive feeling. The person expects that the feed may provide the same feeling again.

This expectation becomes important when most current posts are no longer enjoyable. The user scrolls through ordinary content quickly because the next item may be better.

The search for reward can increase browsing speed. Less time is given to each post. More information passes through attention, and overload becomes stronger.

An interesting post may appear and briefly restore alertness. The user laughs, learns something useful, or receives a message. This moment can hide the level of fatigue.

The session then feels worth continuing. The person stays because the feed has shown that a reward can

appear after a long period of weak content. When the feeling fades, searching begins again.

Long browsing sessions are often held together by these short moments. Most of the session may feel ordinary or tiring. A few rewarding posts are enough to support continued use.

The absence of stopping points makes the process easier. One video leads directly to another. The feed does not show how much content has already been viewed or how much time has passed.

The user may look at the clock and feel surprised. A session planned for a few minutes has lasted much longer. This awareness can create guilt or stress.

Guilt does not always lead to stopping. The user may avoid thinking about lost time by continuing to browse. The feed gives immediate distraction from the uncomfortable feeling.

The task that was delayed now feels more difficult because less time remains. Pressure rises, and the user may feel less willing to begin. Social media becomes a way to avoid the task for a little longer.

This pattern deepens fatigue. The browsing session continues, mental resources decline, and the delayed task creates more stress. The user becomes less able to make the decision that could break the cycle.

Longer use also reduces the chance of recovery. A short period of boredom could have been used for rest. Instead, the mind receives more visual, emotional, and social input.

Browsing before sleep can extend the cycle into the next day. The user stays awake longer, sleeps less, and begins the next day with weaker attention. Low energy makes simple and stimulating content more attractive again.

A tired person may open social media because it feels easier than work or study. The new session begins with lower mental resources than the earlier one. Overload may then appear more quickly.

The cycle can also repeat within the same day. A user browses during a break, returns to work with weak attention, struggles with the task, and opens the platform again. Each session leaves less mental energy for the next activity.

The user may believe that poor focus is the reason for browsing. In many cases, browsing has also helped create that poor focus. The cause and response become difficult to separate.

Repeated use can turn the cycle into a familiar daily pattern. Boredom or stress leads to browsing. Browsing raises stimulation, then creates overload. Overload weakens control. Weak control extends the session and reduces recovery.

The user may no longer make a full decision at each stage. The pattern moves forward through habit. Opening the app, scrolling, feeling tired, and continuing to scroll become linked actions.

Breaking the pattern becomes harder after fatigue is already strong. The user has less attention available for checking time, noticing physical signs, or remembering the original plan. The easiest time to stop may have passed before the person clearly recognizes the problem.

10. Ways to Reduce Cognitive Fatigue

Cognitive fatigue during social media browsing cannot be reduced only by asking users to show more self-control. Browsing habits are shaped by personal goals, daily routines, platform functions, and the way content is presented. Users need practical methods that lower mental demand before fatigue becomes strong. Platforms also need to reduce design features that keep users active without clear need.

The main aim is not to remove social media from daily life. Social media can support communication, entertainment, learning, and access to information. The problem appears when browsing loses its purpose, continues without clear limits, and replaces mental rest. Useful changes should help users decide why they are browsing, notice how long they have stayed, and leave before attention becomes heavily tired.

10.1 Setting Clear Browsing Goals

A clear goal gives social media use a beginning and an endpoint. The user knows why the platform is being opened and what needs to be completed. The goal may be replying to a message, checking an

event notice, reading updates from a group, or finding information about a specific topic.

Goal-based use differs from opening a feed without a clear purpose. Aimless browsing allows every new post to guide the next action. The user may move from videos to comments, from comments to profiles, and from profiles to unrelated topics. A clear goal makes it easier to judge whether each action is connected to the original task.

Users can state the purpose before opening the app. A simple thought such as "I am checking the class notice" or "I am replying to two messages" can keep the task active in working memory. This small step can reduce the chance of moving directly into the main feed.

The goal should be specific. A plan to "check social media" gives little guidance because almost any activity can fit it. A plan to "reply to the work group and confirm tomorrow's meeting time" gives a clear task. The user can tell when the task has been completed.

Specific goals also reduce the number of decisions made during browsing. The user does not need to judge every post in the feed. Content that is unrelated to the task can be ignored more easily. This protects attention and working memory from unnecessary information.

A written note can help when the task is important. The user may write down the name of the person to contact, the question to search for, or the information that needs to be found. This keeps the purpose visible when recommended content appears.

Direct access can also reduce aimless scrolling. Users can open a message from a notification, use a saved link, enter a group page, or search for a specific account. Entering through the main feed creates more chances for unrelated content to take attention.

Search functions should be used with a narrow question. A broad search can produce hundreds of posts and create another endless browsing path. A specific question helps the user judge which results are useful and when enough information has been collected.

Users also need to decide what counts as task completion. When searching for information, the platform will always offer more posts. The person can set a simple standard, such as finding two reliable explanations, saving three useful examples, or answering one clear question.

Without such a standard, uncertainty may keep the search active. The user may believe that a better answer is still available. More browsing then produces more information without improving the final decision.

A clear goal can also help with entertainment use. Entertainment does not need to be treated as meaningless. Watching several videos or checking friends' posts can be a valid form of leisure. The user can still decide what kind of break is needed and how long it should last.

For example, a person may choose to watch short videos for ten minutes after finishing a task. This is more controlled than opening the feed whenever work becomes difficult. The browsing session has a place in the daily plan rather than serving as an automatic response to discomfort.

The user should leave when the planned task is complete. This step is important because the platform will often present new content at the exact moment when the original task ends. A message has been sent, but the main feed is visible. A search result has been saved, but related videos appear below it.

Leaving at this point protects the boundary between purposeful use and continuous browsing. Staying for "just a moment" can change a short task into a long session. The user may then forget why the app was opened.

Closing the platform can be linked to a small physical action. The person may put the phone face down, return it to a bag, stand up, or open the document needed for the next task. This makes the end of browsing more visible.

Clear goals are also useful when users need to post content. Posting may lead to repeated checking of likes, comments, or views. The user can decide in advance when reactions will be checked. This

prevents the post from holding attention throughout the day.

A user may choose to review responses after one hour or at a fixed time in the evening. The exact timing is less important than avoiding constant checking. Repeated checks keep the action mentally unfinished and divide attention during other tasks. Goal-setting should remain realistic. Very strict rules may be difficult to follow and can create guilt after a small failure. A useful goal should fit the user's real communication and leisure needs. The purpose is to reduce unnecessary browsing, not to make every minute of media use productive.

10.2 Creating Natural Stopping Points

Endless feeds remove many of the signs that normally tell users an activity is complete. Users can rebuild these signs by creating stopping points before browsing begins. A stopping point gives the session a visible limit and reduces dependence on self-control after fatigue has already appeared.

Time limits are a direct method. A user may set a timer for ten or fifteen minutes before opening the platform. The timer makes the length of the session visible even when attention is fully directed toward the feed.

The limit should match the purpose. Replying to several messages may need only a few minutes. Searching for detailed information may need more time. Entertainment use may also have a planned period. A limit that is too short may be ignored, while a realistic limit is easier to follow.

A timer should not be treated as a signal to begin negotiating for more time. Users often stop the alarm and continue browsing because the current video has not ended or a discussion remains unfinished. A useful rule is to leave after finishing the item already on the screen rather than starting another one.

The user can also create limits based on the number of items viewed. A person may decide to watch five videos, read three saved posts, or check two comment threads. Counting items gives the session a clear structure.

This method can work well when video length is short and a time limit feels less visible. The user knows that the fifth video marks the end, even when the total viewing time is not being checked.

Fixed-content lists can provide another stopping point. Users can browse from saved posts, selected accounts, or a prepared reading list instead of entering an endless recommendation feed. When the list is finished, the activity has a natural ending. Platform features that display only recent posts from chosen accounts may also help. A limited feed gives users a sense that they have reached the end of the relevant content. Recommendation feeds rarely provide this feeling because new material is always available.

Users can place social media use between two fixed activities. A short session may occur after lunch and end when an afternoon task begins. Another session may happen after work but before exercise. The next planned activity acts as an outside stopping signal. This method works better when the following activity has a clear start. A vague plan to work “later” may not be strong enough to end browsing. A plan to begin reading at 2:00 p.m. or leave home at 5:30 p.m. creates a firmer boundary.

Physical settings can support stopping points. Browsing at a desk, in bed, or on a sofa may continue because the user remains comfortable and does not need to move. Browsing while standing or in a place used only for short checks may reduce the chance of a long session.

The phone can also be placed outside easy reach when the session ends. Leaving it beside the keyboard or on the bed keeps the next check available with almost no effort. Moving it to another table, shelf, or bag creates a small pause before the habit can restart.

App limits and screen-time settings can provide support, but they should not be the only method. Users can often ignore or extend these limits. Their value comes from making time visible and creating a moment of choice.

A stronger system may require the user to enter a code, wait for a short delay, or leave a reason before extending the limit. This extra step interrupts

automatic action. It gives the person time to notice whether continued use is really needed.

Stopping points should also be created inside longer sessions. A user who needs to spend more time on the platform can pause every fifteen or twenty minutes. The person can look away from the screen, check physical comfort, and ask whether the original goal is still active.

This pause should be brief but real. Continuing to watch while checking the clock does not reduce the stream of input. The screen should be put down for a moment so attention can move away from the feed. Users can watch for signs that the session has passed its useful stage. Fast scrolling, weak memory of recent posts, repeated checking, irritation, and low enjoyment often show that attention is already tired. These signs can serve as personal stopping signals. The user does not need to wait for strong exhaustion. Leaving when interest and understanding begin to fall protects more mental energy than leaving only after fatigue becomes severe.

Bedtime needs a firm stopping point because tired users have weaker control. A planned time for putting the phone away is often more useful than deciding to stop “when sleepy.” The user may already be sleepy but continue because the feed keeps attention active.

The end of browsing can be followed by a simple routine, such as washing, preparing clothes, reading a paper book, or turning off the room light. A regular next action makes the stopping point easier to repeat.

10.3 Reducing Attention Interruptions

Notifications, messages, multiple open platforms, and frequent checking divide attention into short periods. Reducing these interruptions lowers the number of mental shifts during work, study, rest, and social interaction.

Not every notification needs immediate attention. Many alerts report likes, recommended posts, new followers, promotional messages, or general updates. They create curiosity but rarely require an urgent response.

Users can turn off sound, vibration, banners, and lock-screen notices for these alerts. Important communication can remain active while less important signals are removed. This keeps the phone useful without allowing every platform action to interrupt the day.

Notification settings should be adjusted by type rather than by app alone. A messaging app may contain both urgent family messages and low-priority group updates. Users can mute large groups, promotional channels, or active discussions while keeping direct messages available.

Visible notification numbers can also draw attention. A red badge showing unread items can create a feeling that something is unfinished. Removing these badges may reduce repeated checking even when sounds are already turned off. Scheduled checking provides another option. Users can review social media at selected times instead of reacting whenever an alert appears. Messages that do not need an immediate reply can wait until the next checking period.

This method reduces uncertainty because the user knows that the platform will be checked later. There is less need to hold the thought of possible updates in working memory.

Several platforms should not be used at the same time without a clear reason. Moving between a short-video app, a message app, a news feed, and a photo platform creates more topic changes and more unfinished mental traces.

Users may switch platforms when one feed becomes boring. The change creates fresh stimulation, but it does not provide rest. Attention remains active and the total browsing period becomes longer.

Closing one app before opening another creates a small boundary. The user can ask whether the second platform serves a different purpose or only continues the same browsing habit.

Browser tabs can create a similar problem. A user may open many social media links while reading an article or completing a task. Each tab acts as a reminder of unfinished content. Keeping only the necessary pages open reduces this mental pressure.

Social media should also be separated from tasks that need stable focus. Keeping the platform open beside a study document makes interruption very easy. Even when the user does not check it, the possibility of checking remains present.

A phone placed on the desk can attract attention through its screen, vibration, or simple visibility. Moving it out of sight may reduce the need to resist checking. The user no longer has to make the same decision every few minutes.

Full-screen work modes and website blockers can help during demanding tasks. These tools reduce access for a fixed period. Their purpose is not punishment. They remove repeated choices at a time when the user needs attention for another activity.

Study and work periods should not be interrupted by very short social media checks. A two-minute check may seem harmless, but returning to the original task can take longer than the check itself. Thoughts from the feed may remain active after the app is closed.

When a work task becomes difficult, users can choose a break that does not introduce new information. Standing up, drinking water, stretching, or looking outside gives the mind a pause without creating another attention stream.

The same separation is useful during face-to-face conversations and meals. Checking the feed divides attention between the people present and the online content. Both experiences become harder to follow and remember.

Keeping the phone away during a conversation also reduces the mental expectation of interruption. The user can listen without watching for a screen change or waiting for a vibration.

Users who manage work or study through social media may not be able to remove it completely. They can separate functional accounts, work groups, or browser windows from entertainment feeds. This reduces the chance that a necessary message will lead directly into unrelated browsing. A work account may follow only professional contacts and required groups. Entertainment content can remain in another account or app. The boundary is not perfect, but it reduces the number

of distracting recommendations shown during task-based use.

10.4 Supporting Mental Recovery

Reducing cognitive fatigue requires periods in which mental input becomes lower. A break is not fully restful when it replaces one stream of information with another. The mind needs time without rapid images, emotional posts, comments, and small decisions.

Screen-free breaks give attention a chance to slow down. The user can walk, stretch, drink water, look outside, or sit quietly. These activities contain fewer changes and do not ask the person to judge new content every few seconds.

A break does not need to be long. Several minutes away from the screen may help after a period of focused work or browsing. The main condition is that the person does not immediately enter another high-stimulation activity.

Quiet activities can be useful after a long social media session. Simple household tasks, light exercise, drawing, listening to calm music, or reading printed material can reduce the pace of incoming information.

The chosen activity should not demand too many new decisions. A complicated game or fast video may change the type of stimulation but still keep attention under pressure.

Walking can support recovery because it shifts attention toward the physical setting. The person notices movement, sound, temperature, and distance rather than a rapid sequence of online messages. This gives earlier thoughts more time to fade.

Users may also need a short period before beginning difficult work. Moving directly from an intense feed to reading or writing can make the task feel unusually slow. A quiet transition helps attention adjust to the lower pace.

During this transition, the user can write down any thoughts that remain active. A message to answer later, a product to check, or an issue raised by a post can be placed on a note. The mind no longer needs to keep each item active.

Rest should also include time in which the user is not producing or checking social responses. Posting, replying, and waiting for reactions can keep attention linked to the platform. A period without checking likes or comments allows the social action to become less mentally active.

Sleep has a central role in cognitive recovery. Short or disturbed sleep weakens attention, working memory, judgment, and self-control. These changes can make continuous browsing more likely the next day.

Users should protect the period before sleep from endless feeds. A fixed phone-free time can allow mental activity to slow down. The device can be charged away from the bed so that checking requires getting up.

Using the phone as an alarm can make this difficult. A separate clock may reduce the need to keep the device beside the bed. The user can then begin and end the day without entering the feed immediately. Notifications should remain silent during sleep. Night messages that are not urgent can wait until morning. Even a brief awakening followed by a screen check can make it harder to return to sleep.

Morning use also affects recovery. Opening social media immediately after waking introduces messages, comparisons, news, and demands before the user has begun the day. Delaying the first check gives attention time to enter daily tasks at a calmer pace.

Regular rest is more useful than waiting until fatigue becomes severe. Short pauses across the day can prevent mental load from building. A user who works for several hours without a real break may have less control over later browsing.

Food, movement, and physical comfort also affect mental energy. Hunger, dehydration, eye strain, and an uncomfortable posture can make cognitive fatigue feel stronger. Users may continue scrolling while ignoring these basic needs.

A break can include checking the body rather than checking the feed. The person may relax the shoulders, change position, drink water, or focus on distant objects to reduce eye strain.

Mental recovery also requires accepting moments of low stimulation. Quiet time may feel uncomfortable after rapid browsing. The user may feel an urge to reach for the phone because nothing new is happening.

This discomfort does not always mean that rest is failing. It can be part of the change from high stimulation to a slower mental state. Staying with the quiet period for several minutes can make the urge weaker.

10.5 Improving Platform Design

Users do not make browsing decisions in a neutral setting. Platform design shapes what they see, how quickly new content appears, and how easily they can stop. Reducing cognitive fatigue requires changes to the environment in which browsing takes place.

Break reminders should appear before users reach a state of strong fatigue. A message shown after a long session can state how much time has passed and invite the user to pause. The reminder should be clear and easy to understand.

A weak reminder that disappears at once may have little effect. Platforms can create a short pause before the feed continues. The user may need to choose whether to resume rather than continuing automatically.

The wording should not shame users. Guilt can create stress and may not lead to healthier use. A useful reminder gives information and supports a clear choice.

Session length should remain visible. Many platforms hide time by presenting content in a continuous stream. A small display showing the length of the current session can help users notice how short actions have added up.

The platform could also show the number of posts or videos viewed. This information creates a sense of scale. Users may not feel that thirty short videos form a long session unless the total is made visible. Daily and weekly reports can be useful, but they should include more than total screen time. Platforms can show when long sessions happen, which features hold attention, and how often users

reopen the app. This helps users see patterns rather than a single number.

Recommendation controls should be simple and meaningful. Users need clear ways to reduce topics that create stress, repetition, conflict, or unwanted comparison. Hiding one post should not require several steps or have little effect on later recommendations.

Users should also be able to choose less personalized feeds. A chronological feed from selected accounts may produce fewer unexpected topic shifts than a fully recommended feed. The user has a clearer idea of what will appear and when the relevant content has been viewed.

Recommendation settings should explain why certain content is shown. When users understand the link between earlier actions and current suggestions, they can make better choices about what to watch, hide, or unfollow.

Platforms can allow users to separate content by purpose. Messages, work groups, news, entertainment, and shopping do not need to appear in the same stream. Clear sections can reduce rapid movement between unrelated topics.

Autoplay should be optional and easy to turn off. When a video ends, the pause can give users a chance to notice time, fatigue, and the original purpose of the session. Starting the next video without a choice removes this point.

Endless scrolling can also be reduced. Feeds may be divided into pages, time blocks, or limited groups of posts. After a group ends, the platform can ask whether the user wants to continue.

A message such as "You have seen the latest posts from the accounts you follow" creates a sense of completion. The platform should not immediately replace this message with another set of recommended content.

Notifications need stronger default limits. Promotional alerts, repeated reminders, and recommendations should not be active unless users clearly choose them. Important direct communication can remain separate from engagement-based alerts.

Platforms should avoid sending notifications only to bring inactive users back to the feed. Alerts should reflect a real event that the user has chosen to follow, not a general attempt to restart browsing.

Design can also reduce emotional overload. Graphic content, public conflict, and repeated negative news may need warning screens, content controls, or limits on repeated recommendations. Viewing one upsetting post should not automatically produce a long series of similar posts.

Comment sections can include options that reduce mental pressure. Users may hide reply counts, limit notifications after commenting, or stop receiving updates from an argument. The platform should make it easy to leave a discussion without continuing to pull the user back.

Users who post content should be able to delay or group reaction notifications. Receiving each like or

comment as a separate alert creates repeated interruptions. A single report at a selected time would reduce checking.

Design should also support quiet use. A low-stimulation mode could reduce animation, autoplay, bright reaction signals, and visible popularity counts. This would allow users to read selected content without the same level of competition for attention.

These changes may reduce the amount of time users spend on the platform. Yet a platform that depends heavily on endless attention can transfer the mental cost of engagement to its users. A healthier design should treat the user's ability to stop, rest, and return to other activities as part of normal use.

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