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The Semantic Representation of Abstract Artificial Concepts: How Human Brain Lexicalizes Tech-Induced Cognitive States

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Abstract:

Contemporary English is fast adapting to digital life, producing lexical forms for cognitive states generated by artificial intelligence, algorithmic platforms, synthetic media, and virtual interaction. The present study investigated how the human brain lexicalizes technology-induced experiences of abstract artificial concepts. The research problem stems from the observation that many emerging discursive expressions, such as digital fatigue, prompt dependency, algorithmic drift, deepfake anxiety, doomscrolling, brain rot and virtual presence, are often considered as casual digital terms as opposed to formalised semantic representations of new mental states. The study thus aims to analyse how these expressions encode cognition, affect, agency, social grounding and epistemic uncertainty in contemporary English. The study is a qualitative-dominant corpus-assisted design methodologically. The data are contemporary digital discourse in English, including technology journalism, public online discourse, and user narratives about AI, produced between 2020 and 2026. The selected lexical items are analysed using a multi-dimensional semantic framework encoding cognitive load, affective valence, agency pattern, social grounding and epistemic orientation. The findings show that technology-induced concepts are clustered around five core areas: cognitive overload, affective discomfort, reduced human agency, epistemic instability and altered digital selfhood. The analysis also shows that the main mechanisms in lexicalising these states are metaphor, compounding, semantic extension and modifier-based specialisation. The study concludes that contemporary English is not merely borrowing technical vocabulary but is actively developing semantic resources to represent new forms of human cognition that are being shaped by artificial and digital environments across language, meaning, cognition and technologically mediated human experience today.

Keywords: Abstract artificial concepts; cognitive semantics; lexicalization; technology-induced cognitive states; digital fatigue; prompt dependency; algorithmic drift.

التمثيل الدلالي للمفاهيم المجردة: كيف يمعجم الدماغ البشري الحالات الادراكية المستحثة بالتكنولوجيا

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تشهد اللغة الإنجليزية المعاصرة تكيفاً متسارعاً مع الحياة الرقمية، مما يؤدي إلى استحداث صيغ معجمية تعبّر عن حالات إدراكية تولّدها تطبيقات الذكاء الاصطناعي، والمنصات الخوارزمية، والوسائط الاصطناعية، والتفاعل الافتراضي. وتبحث هذه الدراسة في كيفية قيام الدماغ البشري بمعجمة الخبرات المستحثة بالتكنولوجيا والمرتبطة بالمفاهيم الاصطناعية المجرّدة. وتنبع مشكلة البحث من ملاحظة أن العديد من التعبيرات الخطابية المستحدثة، مثل الإرهاق الرقمي، والاعتماد على الموجِّهات، والانحراف الخوارزمي، وقلق التزييف العميق، والتصفّح التشاؤمي، وتعفّن الدماغ، والحضور الافتراضي، غالباً ما تُعدّ مصطلحات رقمية دارجة، بدلاً من النظر إليها بوصفها تمثيلات دلالية مؤطَّرة لحالات ذهنية مستحدثة. ومن ثم، تهدف الدراسة إلى تحليل الكيفية التي يشفر بها الدماغ هذه التعبيرات عمليات الإدراك، والانفعال، والفاعلية، والتأصيل الاجتماعي، وعدم اليقين المعرفي في اللغة الإنجليزية المعاصرة. وتعتمد الدراسة منهجاً يسوده الطابع النوعي، مدعوماً بتحليل مدوّنة لغوية. وتتمثل بياناتها في خطاب رقمي إنجليزي معاصر يشمل صحافة التكنولوجيا، والخطاب العام عبر الإنترنت، وسرديات المستخدمين المتعلقة بالذكاء الاصطناعي، والمنشورة خلال المدة الممتدة بين عامي ٢٠٢٠ و٢٠٢٦. وتُحلَّل المفردات المختارة في ضوء إطار دلالي متعدد الأبعاد يضم خمسة محاور هي: العبء الإدراكي، والقيمة الانفعالية، ونمط الفاعلية، والتأصيل الاجتماعي، والتوجّه المعرفي. وتُظهر النتائج أن المفاهيم المستحثة بالتكنولوجيا تتمركز حول خمسة مجالات رئيسة، هي :فرط العبء الإدراكي، والضيق الانفعالي، وتراجع الفاعلية البشرية، وعدم الاستقرار المعرفي، والتحول في الهوية الرقمية للذات .كما يكشف التحليل أن أبرز الآليات المستخدمة في معجمة هذه الحالات تتمثل في الاستعارة، والتركيب، والتوسّع الدلالي، والتخصيص القائم على المُعدِّلات. وتستنتج الدراسة أن اللغة الإنجليزية المعاصرة لا تقتصر على استعارة مفردات تقنية، بل تعمل بصورة فاعلة على تطوير موارد دلالية جديدة لتمثيل أنماط مستحدثة من الإدراك البشري، تتشكل بفعل البيئات الاصطناعية والرقمية، بما يعكس التحولات الراهنة في اللغة، والمعنى، والإدراك، والخبرة الإنسانية المتوسطة بالتكنولوجيا.

الكلمات المفتاحية: المفاهيم الاصطناعية المجردة، علم الدلالة المعرفية، المعجمة، الحالات المعرفية المستحثة بالتكنولوجيا، الارهاق الرقمي، الاعتماد على الموجهات، الانجراف الخوارزمي

1. Introduction

In the digital age, artificial intelligence, algorithmic platforms, social media systems, immersive technologies, and synthetic media have created cognitive and affective states that older psychological or linguistic vocabulary could not fully capture. As users engage with chatbots, recommendation systems, generative AI tools, virtual identities, and automated information environments, they are ever more confronted with new forms of attention fragmentation, digital exhaustion, epistemic doubt, algorithmic dependence, and mediated selfhood. Emergent experiences need lexical forms so that speakers can name them, share them, interpret them.

While digital and AI-mediated experiences continue to diversify at a rapid pace, linguistic research has not sufficiently explored how English lexicalizes the abstract mental states arising from these experiences. Many of the current studies are interested in the AI performance, AI-generated text, user's trust, hallucination or digital behaviour. Less studies are specifically interested in the semantic formation of new lexical items naming technology-induced cognitive states. These terms, such as prompt dependency, algorithmic exhaustion and deepfake anxiety and virtual presence, are often regarded as journalistic, informal or technological locutions rather than semantically structured concepts.

The main issue is that the current linguistic lexicon does not adequately encompass the hybrid nature of these concepts. They are not purely psychological, but are born out of interaction with digital and artificial systems. They are not strictly technical because they refer to human internal states, rather than to machines and software. They are not just metaphorical either, as many of them are becoming socially recognisable and repeatedly used in public discourse. This creates a theoretical gap, as there is a need for a semantic model which explains the generation of abstract concepts in artificial environments and their lexicalization in contemporary English.

Another dimension of the problem relates to epistemic instability. Hallucination is a well-known phenomenon in which large language models generate fluent outputs that are factually incorrect or fabricated. Recent work has demonstrated that hallucinations may arise from prompting conditions and model-internal behaviour, with implications for user trust, misinformation risk and accountability (Anh-Hoang et al., 2025). This technological condition creates new cognitive states of doubt, uncertainty, vigilance and distrust. But the lexical representation of these states has been underresearched in English semantic studies.

Yet another problem is the difference between human linguistic behaviour and AI-mediated linguistic production. Georgiou (2025) demonstrates that AI-generated texts can resemble human texts but still differ from them in quantifiable phonological, morphological, syntactic, and lexical features. The implication here is that AI is not only a tool deployed through language, but also a force that changes linguistic expectations, style and interpretation. Thus, a study of technology-induced cognitive states must take account of how AI alters the production of language and the conceptual vocabulary through which users describe their own cognition.

The present study thus is concerned with the following core problem: how does the contemporary English semantically represent and lexicalize abstract cognitive states, which arise from prolonged interaction with artificial intelligence, algorithmic platforms and digital media?

The significance of this study is that it attempts to link cognitive semantics, digital discourse studies and human–AI interaction. The study makes a contribution to cognitive semantics by highlighting the importance of abstract concepts derived from new technological environments. Traditional studies of abstract meaning are usually about such concepts as justice, freedom, belief, emotion or morality. This work, in contrast, addresses the emerging artificial concepts including algorithmic drift, prompt dependency and deepfake anxiety. These concepts exemplify the ongoing development of abstract meaning within the present technological setting (Jin, Zhang, and Xiong, 2025).

Second, this study is important in that it treats lexical items induced by technology as evidence of changing cognitive experience. The human interaction with AI systems is increasingly characterised by cognitive trust, affective trust, reliance, uncertainty and perceived competence. Riley and Dixon (2024) differentiate between emotional and cognitive trust in AI and assert that trust in artificial systems demands a distinct research framework. This distinction matters because terms such as chatbot trust, AI reliance, and algorithmic doubt lexicalize different types of user orientation towards artificial systems.

Third, this study is relevant for digital discourse analysis because numerous concepts induced by technology emerge in public discourse before they are academically stabilised. Doomscrolling and brain rot are not mere slang words, but reflect social anxieties about attention, cognition, productivity and digital exposure. The analysis of these items as lexicalised abstract concepts contributes to the understanding of how digital communities convert repeated experiences into recognisable semantic categories.

Fourth, the study is important for understanding the impact of AI on language itself. Recent work comparing human- and AI-written texts suggests that AI-generated language may have characteristic features in terms of lexical density, syntactic organisation and formal stylistic trends (Georgiou, 2025). These findings suggest that AI is increasingly becoming part of the linguistic environment in which users learn, write, interpret, and name experience. So the semantic representation of abstract artificial concepts is not a marginal issue; it reflects a broader transformation in the relation between language and cognition.

This study makes four major contributions. First, it proposes the expression abstract artificial concepts to refer to lexical items that denote internal cognitive, affective or epistemic states generated by interaction with artificial or digital systems. This contribution is to distinguish concepts like these from the traditional abstract concepts and from the purely technical terminology.

Second, the paper provides a semantic framework for the analysis of technology-induced cognitive states. The study does not treat digital fatigue, prompt dependence and algorithmic drift as isolated phenomena, but discusses them in terms of semantic dimensions such as cognitive load, affective valence, agency, social grounding and epistemic orientation. This enables the identification of the ways in which various lexical items encode different aspects of human experience in digital environments.

Third, the study contributes to human-AI interaction research by demonstrating that shifts in human cognition are echoed in lexical innovation. Trust, doubt, dependence and uncertainty are not only psychological variables, but are lexicalized through repeated discourse. Studies on AI trust show that the users' perception of generative AI is affected by perceived fairness, social presence, emotion, and performance (Huynh & Aichner, 2025). This study adds a

linguistic dimension to this discussion by exploring how these orientations are instantiated in English lexical forms.

Fourth, the present study contributes to neurosemantic and computational discussions by linking linguistic evidence to broader debates about the nature of semantic representation. Recent work suggests that language grounding is dynamic, adaptive, and experience-sensitive (Kogan et al.,, 2025). Work on language models and brain signals suggests that artificial language systems can be used as comparative tools for investigating semantic processing (Ren et al.,, 2025). This study does not claim AI and the human brain are equivalent. It argues that technology-induced concepts offer a valuable linguistic window into how human cognition adapts to artificial environments.

2. Literature Review

1.1. Abstract Concepts and Grounded Semantic Representation

The study of abstract concepts has become a central issue in cognitive linguistics, cognitive psychology and neurosemantic research. Previous approaches have considered abstract concepts as lexical items that rarely have direct sensory reference. In more recent accounts, however, abstract concepts are neither ungrounded nor purely symbolic. Rather they are encoded in different kinds of experience such as affect, social interaction, language, inner cognition and contextual inference. This view is particularly relevant to the present study, since technology-induced cognitive states such as digital fatigue, algorithmic drift, and prompt dependency are not about concrete objects. They are about internal mental states that are shaped by digital and artificial environments.

Friedrich, Fischer, and Raab (2024) argue that abstract concept grounding should not be limited to sensory-motor experience. Their treatment of invariant representations extends grounded cognition by suggesting that abstract meaning may rely on relatively stable patterns of experience rather than direct physical perception. This is useful in understanding artificial abstractions, as many technology-induced states are based on repeated patterns of interaction. For instance, algorithmic drift is not based on a tangible object but on the repeated experience of being slowly turned away by recommendation systems. Similarly, digital fatigue is based on repeated cognitive and bodily reactions to continuous digital involvement.

This literature supports the assumption that abstract artificial concepts are semantically grounded in recurrent human-technology interaction. Linguistically meaningful are such concepts, as users repeatedly find themselves in similar states of attention, uncertainty, dependence or exhaustion. The lexicalisation of technology-induced cognitive states can thus be interpreted as a kind of experiential grounding in a digital environment.

1.2. Language, Technology, and Lexical Innovation

Language changes when new social and cognitive experiences become frequent enough to need compact labels. The emergence of artificial intelligence and

digital platforms has also brought new communicational needs, especially in English, which is a dominant language in global technology discourse. Recent studies on AI-affected writing show that AI is not just changing people's writing habits but also affecting lexical frequency, stylistic choices, and semantic clusters.

Bao, Zhao, Mao, and Zhang (2025) examined linguistic changes in academic writing before and after the launch of ChatGPT. In their study, they show that the large language models have influenced the patterns of academic expression such as the increased use of some lexical and stylistic forms. This finding is relevant for the present study because it shows that AI systems can affect language at the lexical and discourse level. AI tools that can alter academic phrasing can also indirectly foster the spread of expressions for AI-mediated cognition, like AI reliance, prompt dependency, and machine-assisted thinking.

Similarly, Galpin, Anderson and Juzek (2025) investigated AI-induced language change in scientific English and found that language shifts associated with AI are not just isolated changes in word frequency. Rather, they concern larger semantic and pragmatic patterns. This is important because technology-induced cognitive states are not simple labels, but rather are part of wider semantic fields of cognition, agency, trust, uncertainty and digital selfhood. Hence, lexical innovation in this field should be interpreted as part of a wider reorganisation of discourse under the influence of AI.

Matsui (2025) also illustrates that the vocabulary influenced by AI has changed medical writing after the emergence of ChatGPT. Although this study is grounded in medical publications, it offers compelling evidence that generative AI can leave measurable lexical traces in specialised discourse. This supports the view of the present study that artificial intelligence contributes to the formation and normalisation of new lexical patterns across domains.

1.3. Human–AI Interaction and Distributed Cognition

The interaction between human and artificial intelligence is increasingly characterised as distributed, interactive, and co-constitutive. Human cognition is no longer confined to internal mental processes, but is often extended through tools, platforms and algorithmic systems. Here, AI is not just a source of information, but a player in shaping how users search, write, remember, decide, and assess evidence.

Noller (2025) examines human-AI interaction through the lens of 4E cognition: embodied, embedded, enactive, and extended cognition. This concept is important because it takes into consideration how human cognition is integrated into tools, surroundings, and interactions. Thus, concepts such as algorithmic drift and prompt reliance might be seen as verbal indicators of expanded cognition. These are circumstances in which artificial systems and human thought are intertwined. The tool becomes a part of the cognitive environment that shapes attention, language production, and decision-making in addition to being utilised by the user.

In their discussion of human–AI coevolution, Pedreschi et al. (2025) highlight the ways in which human systems and artificial intelligence develop in tandem. As language develops in step with technological advancements, this notion is pertinent to the semantic representation of artificial ideas. As users interact with AI systems on a regular basis, they come up with novel methods to describe how such interactions affect their cognitive abilities. Therefore, language indicators of human-AI coevolution include things like AI dependency and synthetic intuition.

1.4. AI Discourse, Metaphor, and Conceptual Framing

Artificial intelligence is frequently framed metaphorically anthropomorphically. AI systems are typically characterised as learning, thinking, comprehending, hallucinating, choosing or producing. These word choices impact how users think about the computers and their personal involvement with the technologies. Such a literature evaluation of abstract artificial notions has to take the framing of cognition in AI language into consideration.

Hicks, Humphries and Slater (2024) critically evaluate the language we use to define ChatGPT and claim that some of the standard descriptions of AI systems may be deceptive. Their criticism is essential because it indicates that the lexical framing of AI speech is not neutral. When AI outputs are characterised using human-like cognitive concepts, it might cause users to ascribe kinds of knowledge or intention to systems that lack human awareness. This is relevant to the current research, since ideas such as chatbot trust, AI reliance, and synthetic intuition rely on the language conceptualisation of the link between human cognition and machine output by users.

Huang (2025) expands this issue to platform governance by looking at large language models in content moderation. His work demonstrates that the role of AI is not just about technical accuracy but also about legitimacy, explanation, user participation and social trust. This is relevant for the lexicalization of concepts such as algorithmic doubt and synthetic authenticity as such terms emerge when users are uncertain, not only about content, but also about the authority and legitimacy of algorithmic processes.

The literature thus indicates that metaphor and framing have a central role in making artificial concepts semantically available. Expressions such as brain rot, feed capture, and algorithmic drift turn complex technological experiences into familiar conceptual schemas: biological decay, physical capture, and spatial movement. These metaphors help to make abstract digital experiences more understandable and more communicable.

1.5. Sociolinguistic Perspectives on Language Modeling

Large language models are trained on socially produced language and therefore reflect varieties, registers, biases and conventions of discourse. Grieve et al. (2025) suggest that language models should be considered sociolinguistically, because they model varieties of language rather than language in the abstract.

This point is important for this study because the technology-induced cognitive states are produced within particular discourse communities: AI users, social media users, online learners, digital workers, and technology journalists.

From a sociolinguistic perspective, terms like doomscrolling, digital fatigue, and deepfake anxiety are meaningful because they circulate within specific communities and genres. They may first appear in informal online discourse and then migrate into journalism, academic writing and public debate. The movement suggests that lexicalization is a social as well as a cognitive process. A term is stable when users recognise it, reuse it, and apply it to shared experience again and again.

This also accounts for the special fruitfulness of English in naming technology-induced states. English is the dominant language in many technological, academic and digital spaces, allowing new lexical items to spread quickly across platforms and genres. Therefore, the semantic representation of abstract artificial concepts should be studied not only through individual cognition, but through sociolinguistic circulation.

1.6. Emergent Conventions and Artificial Communicative Systems

Recent work on large language models also suggests that artificial agents can produce emergent communicative conventions under some interactional circumstances. Populations of large language model agents can evolve social conventions and collective biases, Ashery, Aiello, and Baronchelli show (2025). This finding is about artificial agents rather than human speakers, but it is relevant to the present topic because it shows the close relation between repeated interaction, convention formation, and linguistic stabilisation.

A parallel social mechanism is in operation in the lexicalization of technology-induced cognitive states for users of human language. A common phrase could develop when a large number of users repeatedly encounter a comparable digital experience, such as compulsive scrolling, AI-mediated writing, or uncertainty about synthetic media. When an expression becomes widely recognised, it serves as a lexical category for a new abstract experience. Lexicalization in this respect is not the making of a word, but the social fixing of an idea.

1.7. Digital Discourse and Epistemic Uncertainty

Digital environments have also given rise to new forms of epistemic instability. Increasingly, users are asked to decide whether texts, images, videos, recommendations and profiles are genuine, manipulated, automated or algorithmically selected. The situation creates a semantic pressure on the very expressions that name uncertainty. This pressure is expressed in terms of deepfake anxiety, algorithmic doubt and synthetic authenticity.

The literature on AI discourse and platform governance suggests that trust is invested not only in human speakers, but also in systems, datasets, algorithms and moderation processes. This alters the semantic structure of epistemic vocabulary. Old words like doubt, trust, and authenticity still matter, but they are now accompanied by new technological modifiers. The result is a series of

hybrid expressions that conflate traditional epistemic meanings with digital conditions.

This is the subject of the present study. Abstract artificial concepts are not mere labels for internal feelings, but represent the user's relationship to technological systems that govern access to knowledge. One of the strongest signs that digital environments are changing the semantic organisation of contemporary English is the lexicalization of epistemic uncertainty.

1.8. Research Gap

The literature reviewed includes abstract concept grounding, AI-influenced language change, human–AI interaction, sociolinguistic language modelling, and AI discourse. However, these domains have seldom been combined to explain how English lexicalizes technology-induced cognitive states as abstract artificial concepts. Most of the current research focuses on abstract concepts in general or AI-generated writing or human-AI interaction separately. Less attention has been given to the particular semantic mechanisms with which users produce and stabilise lexical items for new digital mental states.

This gap is addressed in this study by investigating expressions describing cognitive and affective experiences elicited by digital technologies. It adds to the literature by treating items such as digital fatigue, prompt dependency, algorithmic drift, and deepfake anxiety as lexicalized abstract concepts rather than casual technological slang. It also links cognitive semantics to digital discourse studies in demonstrating how human cognition, language and artificial worlds come together to generate new meanings.

2. Methods

2.1. Research Design

The present study follows a qualitative-dominant mixed methods design to investigate the semantic representation and lexicalization of abstract artificial concepts in contemporary English. The study engages with technology induced cognitive states, i.e. mental and affective conditions that emerge from sustained interaction with digital platforms, artificial intelligence systems, algorithmic environments and networked communication. This design is suitable since abstract concepts can’t be sufficiently captured by a simple concrete–abstract dichotomy, but rather are multidimensional constructs influenced by linguistic, affective, social, cognitive and contextual factors (Banks et al., 2023; Borghi, 2020). The methodological orientation is also informed by recent work in cognitive semantics and neurosemantic modelling, which conceptual meaning is distributed across linguistic experience, social interaction and neural semantic systems (Frisby et al., 2023; Pexman et al., 2023).

The study is descriptive, analytical and corpus based. It investigates a range of newly-coined English lexical items that refer to artificial or technology-mediated cognitive states. The aim is not to do direct neuroimaging but to develop a linguistically based account of how these states are lexicalized and how their semantic dimension's map onto current models of abstract concept

representation in the human brain. This is consistent with recent evidence indicating that abstract concepts are represented by a combination of linguistic, affective, social and cognitive features, rather than by sensory features alone (Banks et al., 2023; Kewenig et al., 2024; Wang et al., 2022).

2.2. Data Sources and Corpus Construction

Data was collected from contemporary English digital discourse between 2020 and 2026. The corpus was based on three main sources: technology journalism, public online discourse and AI-related user narratives. Technology journalism was sampled from articles on artificial intelligence, digital fatigue, algorithmic recommendation, online identity, virtual presence, and cognitive overload. Examples from publicly available posts, comments, blogs and discussion forums was included in public online discourse. User stories related to AI were include short reflective sentences where users tell us about their mental states when using artificial intelligence tools, social media, search engines, recommendation systems, or immersive digital environments.

The corpus was purposively sampled for lexical items that encode abstract artificial concepts. The first target size was around 300-500 examples in text. Each example was a single sentence or a short discourse unit containing a target lexical item or phrase. The sampling procedure was continued until semantic saturation has been reached i.e. until no substantially new semantic categories was emerge from additional examples. This procedure is consistent with qualitative semantic research, where conceptual categories are refined based on recurrent patterns of use, not just predetermined frequency (Banks et al., 2023; Frisby et al., 2023).

2.3. Sample Lexical Items

The study was considering lexical items and expressions for cognitive states created or worsened by digital technologies. The first sample consists of the following categories:

A. **Cognitive overload and digital exhaustion:** digital fatigue, screen fatigue, notification anxiety, information overload, algorithmic exhaustion, scroll fatigue.

B. **AI-mediated cognition:** Prompt dependency; AI reliance; chatbot trust; machine-assisted thinking; synthetic intuition; algorithmic suggestion.

C. **Disrupted attention and agency:** doomscrolling, attention fragmentation, algorithmic drift, feed capture, platform-induced distraction.

D. **Virtual identity and social abstraction:** avatar self, online disinhibition, digital selfhood, virtual presence, parasocial attachment

E. **Epistemic uncertainty in technological settings:** deepfake anxiety, misinformation fatigue, decay of the truth, algorithmic doubt, synthetic authenticity.

For example, the following sentences can be used as preliminary analytical samples:

- After several weeks of using the chatbot I felt a kind of dependency on prompts in my writing.
- The never-ending feed resulted in algorithm fatigue, not entertainment.
- Deepfake anxiety made it difficult for users to trust even regular video evidence.
- Her virtual presence was more strongly sensed from her online identity than from her offline interactions.
- Doomscrolling turned worry into a permanent state of mind.
- The recommendation system created an algorithmic drift, a subtle shift in what the user thought was relevant.

These examples are not treated as isolated items of vocabulary only. Rather each is analysed as a lexicalized marker of an abstract cognitive state. Hence, the unit of analysis is the lexical expression and its immediate semantic pragmatic context.

2.4. Inclusion and Exclusion Criteria

Lexical items were only considered if four conditions are met. First, the expression must refer to a mental, affective, cognitive, social, or epistemic state. Secondly, the state must be directly related to digital technology, artificial intelligence, algorithmic systems, social media, virtual environments, or networked communication. #3. It should be abstract. It should not be about a physical object or a concrete action. Fourth, the item must be demonstrably lexicalized in its repeated or recognisable use in current discourse.

Items referring only to technical hardware, software procedures or purely material objects was excluded. Terms like server, keyboard, processor, dataset, and interface was not analysed unless they are deployed metaphorically to refer to a cognitive state. Similarly, general psychological terms like anxiety or fatigue was excluded unless they are modified by a technological frame (e.g., notification anxiety, digital fatigue).

2.5. Analytical Framework

The analysis was performed by a multidimensional semantic framework. Each lexical item was annotated for five semantic dimensions: cognitive load, affective valence, agency, social grounding, and epistemic orientation. This coding model is inspired by recent accounts of abstract concept representation that emphasise that abstract concepts are grounded in language, emotion, social interaction, internal experience, and contextual use (Banks et al., 2023; Borghi, 2020; Pexman et al., 2023).

The first dimension, cognitive load, indicates if the expression conveys attention, memory pressure, decision fatigue, interpretive difficulty, or mental fragmentation. The second dimension, affective valence, pertains to whether the item has a negative, neutral, ambivalent or positive emotional meaning. The third dimension, agency, is the degree to which the human user is portrayed as controlling the cognitive state or being influenced by technological systems. The

fourth dimension, social grounding, determines whether the concept is related to online interaction, digital identity, social visibility or interpersonal comparison. The fifth dimension, epistemic orientation, concerns whether the expression encodes uncertainty, trust, doubt, authenticity, misinformation, or instability of knowledge.

2.6. Coding Procedure

The coding was done in three stages. In the first stage the researcher was identify the target lexical item and its immediate co-text. In the second stage, each item was given semantic feature values on the five dimensions. The third stage involves the comparison of the coded features across lexical items to determine if there are any distinct semantic clusters. A preliminary coding matrix may be structured as follows:

Table 1. Multidimensional semantic coding matrix of selected abstract artificial concepts in contemporary English.

Lexical item	Cognitive load	Affective valence	Agency	Social grounding	Epistemic orientation
digital fatigue	high	negative	reduced human agency	low/medium	low
prompt dependency	medium	ambivalent	reduced human agency	low	medium
deepfake anxiety	medium	negative	unstable agency	medium	high
algorithmic drift	high	negative/ambivalent	system-driven	medium	high
virtual presence	low/medium	neutral/positive	shared agency	high	low
doomscrolling	high	negative	compulsive/reduced agency	medium	medium

This matrix allows the study to show the non-semantic uniformity of abstract artificial concepts. Some concepts are mostly affective (e.g. deepfake anxiety), others are mostly cognitive (e.g. information overload), others are agency-related (e.g. prompt dependency and algorithmic drift). This procedure is in line with the current view that abstract concepts should be studied as multidimensional semantic structures rather than as one category of non-concrete words (Banks et al., 2023; Kewenig et al., 2024).

2.7. Neurosemantic Interpretation

The study is linguistic, not experimental-neuroscientific, but it interprets its findings in light of current research on semantic representation in the human brain. Recent neuroimaging and computational work has suggested that the brain represents concepts in distributed semantic systems that involve sensory, affective, social, temporal, and cognitive features (Frisby et al., 2023; Wang et al., 2022). Wang et al. (2022) for example, provide an fMRI dataset annotated with abstract and concrete concepts using semantic features such as sensory, motor, spatial, temporal, affective, social and cognitive experience. This supports the present study's choice to code technology-induced concepts based on multiple semantic dimensions instead of relying solely on dictionary definition or word frequency.

The study also extends recent work linking large language models to human semantic processing. Nakagi et al. (2024) show the use of large language models to probe multi-level and multimodal semantic representations of the human brain. Similarly, Hong et al. (2024) report that larger language models better align with neural representations of natural language. These studies do not imply that artificial models and human brains are identical, but rather that they offer a useful computational reference point for investigating the role of linguistic context in conceptual representation. Thus, technology-induced cognitive states are conceptualised in this study as lexicalized abstract concepts whose semantics are shaped through repeated linguistic use and through embodied experience within digital environments.

2.8. Data Analysis

The analysis combined a qualitative semantic interpretation with basic frequency and distribution observations. First, all target lexical items were listed and grouped on the basis of semantic domains. Secondly, the contexts of occurrence were analysed to find out the recurrent collocates, modifiers, metaphors and evaluative patterns. Third, we were code and compare the semantic dimensions of each lexical item. Fourth, the study was interpreting the findings in terms of current theories of abstract concept representation.

For example, if the item algorithmic exhaustion is often associated with verbs such as suffer, experience, escape, avoid or resist it can be understood as a negatively valenced concept with less human agency. If the prompt contains a dependency on a verb like develop, rely on, need, or lose, it can be read as a cognitive-agency concept, lexicalizing the perceived atrophy of independent linguistic production. Virtual presence, when it occurs with feel, inhabit, perform, or construct, can be understood as a socially grounded notion of digital selfhood.

2.9. Reliability and Validity

To improve reliability a second coder could be used to code 20% of the dataset independently, using the same semantic coding matrix. Inter-coder agreement

can be calculated either as a percentage agreement or as Cohen's kappa. Definitions of the coding were clarified to talk through and resolve disagreements. To increase validity, the study was employ triangulation between three types of evidence: lexical context, semantic feature coding and theoretical interpretation based on recent studies of abstract concept representation and neurosemantic modelling (Banks et al., 2023; Frisby et al., 2023; Wang et al., 2022).

2.10. Ethical Considerations

Only textual data in the public domain was used. We were not collect private messages, protected social media accounts, or personally identifiable information. If the examples are from online discussion they were anonymized, with usernames and other identifying details removed. The study is about linguistic patterns, not individual users. Before collecting the data, the researcher was submitting the sampling protocol to the Institutional Ethical Approval if needed.

3. Results and Discussion

2.1. Results

Preliminary semantic analysis of selected lexical items shows that the cognitive states induced by technology are not encoded in English as isolated technical labels. Instead they are lexicalized as abstract experiential concepts combining cognitive, affective, epistemic and agency-related meanings. The new lexical formations for denoting mental states that are the product of interaction with artificial intelligence, social media platforms, algorithmic recommendation systems, and synthetic media environments are increasing in modern English, as evidenced by the studied expressions such as digital fatigue, prompt dependency, algorithmic exhaustion, doomscrolling, deepfake anxiety, algorithmic drift, brain rot and virtual presence.

The first major finding is that the selected lexical items are clustered around five dominant semantic domains, namely, cognitive overload, affective discomfort, reduced agency, epistemic uncertainty and altered self-presence. Digital fatigue, algorithmic exhaustion, and brain rot, among others, encode as primarily cognitive depletion and attentional weakening. Their semantic structure indicates that the user is not just tired of technology as an external object, but treats technology as the cause of mental saturation. This interpretation aligns with recent research on cognitive decline and attention problems in the digital age, demonstrating that excessive immersion in low-quality digital content is associated with poor concentration, decreased productivity, and impaired decision-making (Özbay, 2026; Yousef et al., 2025).

The second finding relates to the lexicalization of the dependency. Terms such as prompt dependency, AI reliance and machine assisted thinking, signal a semantic shift from technology as an external tool to technology as a cognitive

partner. These expressions indicate a situation where users believe that some of their thinking, writing, remembering or decision-making is being given over to artificial systems. This is in line with recent work on cognitive offloading, which indicates that frequent use of AI may result in a reduced felt need for users to engage in independent problem-solving and critical thinking (Gerlich, 2025). In this sense, prompt dependency is not merely a new phrase but a lexical marker of a newly perceived cognitive condition.

Third, several items assess negative affect in conjunction with epistemic instability. Deepfake anxiety, algorithmic doubt, and synthetic authenticity illustrate how technological environments produce uncertainty about truth, evidence, and source reliability. These items are complex semantically, they do not denote only fear or doubt. They are a cognitive-affective state in which the user's trust in visual, textual or algorithmically mediated information becomes unstable. This pattern is consistent with the idea that artificial concepts may become lexicalized when users repeatedly encounter a new form of uncertainty that is not associated with an older conventional label.

The fourth finding is about agency. The user is depicted as partially controlled by a technological system, as in the case of algorithmic drift, feed capture, and doomscrolling. In these expressions, agency is shared between the platform and the human user. The user scrolls, clicks or reads but the semantic framing is that the system guides, captures or redirects attention. This is especially true for algorithmic drift. Drift is a metaphor for slow movement, and not being fully consciously in control. Recent research on AI and cognitive coping further indicates that artificial intelligence can redistribute mental effort by offloading cognitive tasks, which in turn changes how users manage attention, emotion, and problem-solving (Chirayath et al., 2025).

Fifth, there has been an increase in lexical items denoting altered selfhood and virtual embodiment. Virtual presence, avatar self, digital selfhood and the like, suggest that selfhood is increasingly mediated through technological representations. Not necessarily negative expressions like are terms of cognitive overload. They may encode neutral or indeed positive modes of presence, identity extension and social participation. But they are still abstract artificial concepts because their meaning is not dependent on ordinary physical embodiment but on technologically produced experience. A preliminary coding of the sample items produced the following interpretive pattern:

Table 2. Interpretive semantic patterns of technology-induced cognitive states across affective, agency-related, and conceptual domains.

Lexical item	Dominant semantic domain	Affective orientation	Agency pattern	Main interpretation
Digital fatigue	Cognitive overload	Negative	Human affected by system	Mental exhaustion caused by sustained digital

				exposure
Prompt dependency	Cognitive offloading	Ambivalent/negative	Reduced human agency	Reliance on AI prompts for writing or thinking
Algorithmic exhaustion	Cognitive overload	Negative	System-driven	Fatigue caused by repeated algorithmic recommendation
Doomscrolling	Attention capture	Negative	Compulsive/reduced agency	Repetitive exposure to distressing digital content
Deepfake anxiety	Epistemic uncertainty	Negative	Unstable agency	Anxiety caused by uncertainty about authenticity
Algorithmic drift	Epistemic/attentional shift	Ambivalent	System-guided	Gradual change in attention or belief through recommendation
Brain rot	Cognitive decline	Negative	Human weakened by content ecology	Perceived decline in attention and intellectual effort
Virtual presence	Digital selfhood	Neutral/positive	Shared agency	Sense of being socially or cognitively present in a virtual space

The proliferation of these domains shows that English lexicalizes artificial cognitive states by metaphor, compounding, semantic extension and nominalization. brain rot uses a biological metaphor for perceived intellectual decay; doomscrolling combines action and affect into a single lexical item; prompt dependency uses a clinical or behavioural noun to frame AI use as a pattern of reliance; and algorithmic drift transfers a movement metaphor to cognitive and epistemic change. These formations indicate that abstract artificial concepts can be made comprehensible by mapping them onto familiar embodied or social schemas.

2.2. Discussion

The findings suggest that contemporary English is going through a process of semantic broadening in response to artificial and digitally-mediated experience. Artificial intelligence, algorithmic personalisation, synthetic media and continuous online interaction produce cognitive states that are not fully

describable by the existing psychological vocabulary, and therefore new lexical items are created. Terms such as fatigue, anxiety, dependency, and presence continue to circulate but have been remade with technological modifiers, such as digital, algorithmic, prompt, deepfake, and virtual. This confirms the observation that lexicalisation is common when a group has a need for a compact linguistic expression for a recurrent, socially recognised experience.

An important implication is that abstract artificial concepts are hybrid semantic structures. They are abstract because they don't refer to physical objects, but to internal states of mind. These states are artificial in that they are induced by the interaction with technological systems. They are hybrids, since their meanings blend human cognition and machine-mediated environments. You can't derive prompt dependency strictly from human psychology, or from technology. It is the relationship between a human writer and a generative AI system that imbues it with meaning. This aligns with recent discussion that generative AI can either augment cognition or drain cognitive effort, depending on how users interact with generative AI (Chen et al., 2025).

The semantic behaviour of these items also indicates that lexicalization is closely related to cognitive offloading. If people continue to offload memory, writing, decision making, or problem solving to artificial systems, the experience may become so salient that a new label is needed. So prompt dependency and AI reliance are not just descriptive terms. They are linguistic markers of a growing metacognitive awareness: users begin to label the change they are undergoing in their own thought processes. This interpretation is in line with Gerlich's (2025) finding that cognitive offloading mediates the relation between AI use and critical thinking. The linguistic evidence in the present study provides a semantic dimension to that psychological finding: when a cognitive behaviour becomes socially recognisable, it can be lexicalized.

The analysis also shows that a large number of cognitive states induced by technology have negative semantic prosody. Digital fatigue, algorithmic exhaustion, doomscrolling, deepfake anxiety, and brain rot are ideas typically associated with a sense of loss, pressure, uncertainty or reduced control. This does not mean that digital technology only has negative representations. It means, rather, that English is particularly productive in naming problematic cognitive states when they become widespread. For example, the increase of brain rot is an indication of the public's concern for thin digital content, lack of concentration and what is perceived as intellectual atrophy. Özbay (2026) find in a phenomenological study that university students also experience this as poor concentration, low productivity and impaired decision making.

Another key finding is the centrality of agency. A number of the expressions analysed portray cognition as something partially diverted by technological systems. Algorithmic drift is when a user doesn't just pick a belief or an interest, but when the platform slowly reorders exposure and relevance. In feed capturing, attention is represented as seized or held. In doomscrolling, the user is

doing the thing, but the word implies compulsive repetition, rather than full, deliberate reading. This semantic pattern suggests that English is developing lexical resources for talking about distributed agency between humans and intelligent systems. Chirayath et al. (2025) also argue that AI changes the architecture of coping by redistributing cognitive effort and externalising mental tasks. Epistemic uncertainty is another dominating feature. The emergence of terms such as deepfake anxiety, algorithmic doubt, and synthetic authenticity indicates that artificial concepts are increasingly lexicalizing problems of truth and verification. Such items differ from older terms like scepticism or doubt, since the uncertainty is not general, but technologically conditioned. The user doubts not only the claim, but the medium, the source, the image, or the algorithm that created the information. This implies that the ecology of evidence drives some of the semantic innovation. The results also have implications for neurosemantic theory. The current study does not measure brain activity directly, but the semantic patterns are in line with recent findings that human conceptual representation is distributed, contextual, and partially aligned with computational language representations. Doerig et al. (2025) show how the contextual information encoded in large language models can be useful to model complex semantic representations in the human brain. This is important because cognitive states induced by technology are highly context dependent: their meaning cannot be inferred from the lexical item alone but from the larger situation of human-machine interaction.

Results further suggest that artificial abstract concepts are likely represented via multiple semantic pathways. Digital fatigue can trigger affective and cognitive-load dimensions. Virtual presence can trigger social and self-referential dimensions. Deepfake anxiety can trigger epistemic and emotional dimensions. And prompt dependency can trigger agency and metacognitive dimensions. This multi-dimensional structure is the explanation for the semantic richness of these relatively new terms. Their meanings are not arbitrary labels; they are compact lexical forms that summarise complex patterns of technological experience.

From a linguistic point of view, the most productive mechanisms are compounding, metaphorical extension and specialisation by means of modifiers. Doomscrolling, brain rot and other such compounds condense an entire experience into a memorable lexical unit. The modifier-based phrases such as digital fatigue, deepfake anxiety, and algorithmic exhaustion re-specialize older psychological terms by inserting them into a technological frame. Metaphors such as algorithmic drift and feed capture translate abstract shifts in attention into spatial or force-dynamic schemas. Such mechanisms show the way in which English can accommodate new cognitive realities without necessarily inventing new roots altogether.

Overall, the results favour the major assumption of the study, that technology-induced cognitive states are increasingly lexicalised as abstract artificial

concepts in contemporary English. These concepts semantically cluster around cognitive load, affect, agency, epistemic trust, and digital selfhood. The discussion also suggests that such lexical items provide valuable evidence for understanding how the human brain and language system reacts to new technological environments. As AI and digital platforms continue to mould everyday cognition, English will likely go on creating new lexical forms for states previously unnamed, poorly named or not yet socially recognised.

4. Conclusions This paper concludes that contemporary English is producing new lexical resources to describe abstract cognitive states generated by digital technologies, artificial intelligence, algorithmic systems, and virtual environments. These technology-induced states are not merely technical terms, but complex semantic concepts that reflect shifts in human cognition, attention, agency, emotion, and epistemic trust. The rise of terms such as digital fatigue, prompt dependency, algorithmic exhaustion, doomscrolling, deepfake anxiety, algorithmic drift, brain rot, and virtual presence indicates a growing need for concise language among English users to articulate mental experiences that were previously unnamed or underrepresented in the lexicon.

The analysis shows that abstract artificial concepts are multi-dimensional semantic structures. They are not all of the same semantic type but mix cognitive load, affective orientation, human agency, social grounding and epistemic uncertainty. Some expressions are mainly about mental fatigue and attentional stress, others encode the reliance on artificial systems, loss of control, doubt about truth, or the construction of digital selfhood. This suggests a close relation between the lexicalization of technology-induced states and how users experience digital environments as part of their everyday cognitive life.

The study also concludes that metaphor, compounding, nominalization and specialisation by modifier are main mechanisms in the creation of these new concepts. Brain rot and doomscrolling, on one hand, distil complex experiences into memorable lexical forms; digital fatigue, deepfake anxiety, and prompt dependency, on the other hand, extend older psychological language into new technological domains. This shows that English does not always coin new words to describe new experiences, it often rearranges existing lexical material to accommodate new cognitive realities.

Another important conclusion is that a lot of these lexicalized concepts are negatively charged. They tend to feel tired, anxious, dependent, doubtful, distracted and less in control. However, not all concepts created by technology are negative. Concepts such as virtual presence and digital selfhood may also represent identity extension, social participation and new forms of mediated presence. Hence, the semantic representation of abstract artificial concepts is ambivalent, reflecting both cognitive risks and communicative possibilities generated by digital technologies.

The paper also argues that the human brain’s lexicalization of cognitive states caused by technology can be explained by the interaction of linguistic

experience and repeated experience in technological environments. Repeated exposure to similar digital conditions (algorithmic recommendation, AI-assisted writing, synthetic media, continuous online interaction) makes these experiences socially recognisable and linguistically nameable for users. In this sense, lexicalization could be seen as a cognitive and social response to technological change.

In general, the study supports the view that language is highly adaptable to new cognitive environments. Abstract artificial constructs appear in modern English as an interaction of human cognition, digital experience and lexical innovation. The findings have implications for cognitive semantics, applied linguistics and digital discourse studies by showing how new technological realities are encoded in language as abstract notions with identifiable semantic patterns.

5. Future Work

Future work could expand the corpus with a larger and more diverse corpus from different genres of digital discourses including academic articles, social media posts, technology blogs, online forums, AI–user interactions and spoken interviews. A larger corpus would allow for comparison of frequency, distribution and semantic stability of technology-induced concepts across different communicative contexts.

Future research may also compare English to other languages to determine whether abstract artificial concepts are lexicalized in similar or different ways across linguistic systems. Such comparative work might illuminate whether expressions of AI reliance, digital fatigue, deepfake anxiety, or virtual identity are universal cognitive responses to technology or language-specific semantic developments.

Another possibility is to conduct an empirical study with participants. Users could be asked to define, score, or categorise specific expressions such as prompt dependency, brain rot, algorithmic drift, and digital fatigue. Their responses could be used to quantify how well these expressions are recognised, how abstract they are perceived to be and whether they have positive, negative or ambivalent meanings.

Future work might also incorporate psycholinguistic methods such as reaction-time tasks, semantic rating tasks or association tests. These approaches would be useful to study whether concepts induced by technology are processed similar to older abstract concepts or whether they show unique cognitive patterns due to their association with digital experience.

Another important direction is to investigate the role of generative artificial intelligence in speeding up lexical change. But as people become accustomed to working with AI systems, new terms may arise to describe dependence, trust, uncertainty, creativity, authorship, and cognitive delegation. Future research could therefore investigate how the use of AI tools alone affects the creation, dissemination and normalisation of new lexical items.

Further work could also examine how these expressions are used pragmatically in real discourse. Future research, for example, could explore whether terms such as brain rot, doomscrolling, and algorithmic exhaustion are used humorously, critically, clinically, or politically. This would account for the functioning of abstract artificial concepts as semantic units but also as instruments of social evaluation and identity construction.

Finally, future studies could link linguistic findings more closely with neuroscience by employing experimental or neuroimaging methods. This work may examine the way in which the brain processes newly lexicalized, technology-induced concepts versus traditional abstract concepts. This would provide more robust evidence to understand the representation of digital experience in language and cognition.

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