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Memetic Phrase Evolution: A Corpus Based Computational Analysis of Viral Language on Social Media

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ABSTRACT
Nowadays, language is a dynamic, developing system, with words and phrases gaining new meanings, with meanings changing, and even coming and going in a few weeks with the advent of social media. This research deals with evolutionary phonetics via computational approach based on a corpus. It analyzes a huge amount of data from websites like Twitter, YouTube, Reddit and other social media platforms, and gives insights into what makes a phrase go viral and how these phrases develop over time in terms of virality. Using techniques of frequency analysis, collocation patterns, sentiment tracking and temporal modeling, the work shows that memetic phrases undergo an evolutionary process much like that of biological evolution. The evolution of a meme is shown to be affected by the affordances of the platform, the ways people interact with the meme, and by contextual reinterpretations. A replication of a computational framework to investigate language change in online contexts is not only an independent contribution to the fields of corpus linguistics and digital discourse, but it may also serve as an example for other researchers interested in studying language change in digital settings.The terms used in the title are memetic phrases, viral language, social media discourse, corpus linguistics, computational linguistics, natural language processing, semantic shift, memetic drift, sentiment analysis, collocation analysis, temporal modeling, language evolution, digital discourse, lexical innovation, cross-platform analysis.

Introduction
Social media has greatly affected how and how fast language evolves, making the linguistic expression a product of very short time scales. According to the theory of memetics, a memetic phrase is a unit of information, a linguistic content that can be reproduced, modified and adapted like organisms, and that is propagated via the mechanism of imitation and variation and adaptation. Memetics was originally proposed

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by Richard Dawkins (1976). Algorithmic curation, user interaction and multimodal communication, however, have increased the linguistic circulation and transformation in such contemporary digital environments as seen in platform affordances (Madsen, 2026). In the newest studies of corpus linguistics and digital discourse, it has been revealed that social media actively supports the creation of new linguistic forms, with the creation of new forms being extremely rapid and the gradual creation of new forms over an extended period of time (Sengupta et al., 2024; Karimova, G., 2023). Moreover, computational research shows that these expressions continue to undergo semantic changes and take on new shapes over the course of time; at times, they even become more general and vague in later uses what academics call “memetic drift” (Attardo, 2024).

These diachronic features were also systematically monitored with the introduction of NLP and big data computational modelling, and patterns of linguistic changes could be detected in digital corpora (Ishita & Mamidi, 2025). Moreover, interdisciplinary research has recently revealed that the production of hybrid language styles involves the use of Artificial Intelligence and platform-specific characteristics in online communication, such as the incorporation of humor, creativity, and global-local features (Gulzar et al., 2025). The computational based corpus approach is used as a research methodology in order to study the life cycle of memetic phrases, the emergence of memes, the virality and the semantic change of memes on social media. It does so, too, because it helps to establish a systematic account of the understanding of the dynamic process of meaning production, negotiation and transformation in today's online discourse, thereby also helping to develop the field of digital linguistics.

Literature Review

The basic concept of memetic phrase evolution is similar to the basic concept of memetics first proposed by Richard Dawkins in The Selfish Gene (1976) in which cultural entities (memes) are viewed as replicators that evolve in the same way as the way that biological entities evolve. Today we are seeing a testing ground of Dawkins' model, more or less theoretical, but in which the processes of meme transmission can be observed and measured and even analysed computationally on the fly. Memetics is a science now possible as it is now possible to track propagation, mutation and stabilisation of the linguistic units over large-scale corpora and to use social media platforms as a source.

In the last few years, attention has been paid to the linguistic impact of social media. According to D. Ø the platform's features such as algorithmic recommendation systems, hashtag indexing, multimodal interaction significantly accelerate the spread and dissemination of memes. The characteristics of the platform, such as algorithmic recommendation systems, hashtag indexing, and multimodal interaction, can often fuel memetic diffusion even further, making it faster and stronger. These contribute to the visibility and at the same time influence the structure of memetic phrases, favoring their brevity, humor and intertextuality. Likewise, Tanmoy Chakraborty et al. (2024) present evidence for the emergence of hybrid expressions (codeswitches) in a multilingual context and the role of socio-demographic and technological factors in the processes. It appears as though memetic phrases can be identified in places where there is a merging of linguistic creativity and a socio-cultural identity.

Corpus studies of lexical innovation have been a new trend in recent years with the advent of new, large digital corpora. The research methods used in the studies are frequency analysis, collocation network, concordance, which is used to find out the emergence of new expressions and semantic stability. Interestingly, the memetic phrases

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have been found to have a typical lifecycle pattern by analysing them using the corpus methodology: Emergence, Rapid spread, Viral peak, Semantic expansion and Normalisation/Decay.

One of the important features of memetic evolution is that over time, there is a semantic shift in the meaning. According to Salvatore Attardo (2024), memetic drift is the evolution of viral expressions becoming over time more context-free and/or less precise. This process often manifests itself in ironic reinterpretation, re-contextualization and broad imitation by numerous discourse communities. Computational results support this notion as collocational changes and sentiment polarity changes are suggestive of more semantic changes. So, expressions which are highly emotional or evaluative may shift to a neutral or ironic tone when they become repetitive.

The use of natural language processing (NLP) has greatly improved the research of memetic language. In the paper titled “Machine Learning (2025) - New Approach for analysis of Gen Alpha Slang and its issues in inter-generational understanding and semantic interpretation”, Ishita and Radhika Mamidi explore the use of machine learning models to analyze the change of slang and identify problems in inter-generational understanding and semantic interpretation. They show how language changes over time, which can be seen in the differences between computational tools like word embeddings, sentiment analysis and temporal modeling. These methods can support the researchers to go beyond the descriptive level of change and to model change as a process.

At the same time, another interdisciplinary research by Rizwan Gulzar et al. (2025) discusses the implications of AI in meme creation and sharing. According to their results, AI-generated content is an element of hybrid registers, which fuse formal and informal registers, humour, and cultural references. This demonstrates another new facet of the memetic evolution, in which both the human and machine created language interact to create new language forms.

Another important component that is highlighted in the literature is the significance of the user interaction and the contextual variability. Memetic phrases are not arbitrary phrases, but rather are formed by the communication process in the Internet community sphere. Research indicates that remix culture, comments, and retweets help to re-interpret and adapt phrases in different contexts. This is related to what theory of sociolinguistics accepts, a language is a system negotiated by the users. In a digital environment, users keep on editing and remixing linguistic material to suit new communicative functions, thereby adding to the negotiation.

Also, due to the different cultures of the platforms, memetic phrases are used and interpreted differently. For instance, the meaning of an expression can vary when it's transferred to Reddit, YouTube, and Twitter, depending on the context and the norms of the different platforms and users. This platform-to-platform crossbreeding frequently coincides with further semantic drift (e. g. broadening) and its ambiguity, thus strengthening the concept of memetic drift.

While there have been some major developments, the research has primarily focused on one domain of memetic language – sentiment analysis or meme categorisation – to date with very few works providing a comprehensive description of the development of the memetic language over time. However, there are some gaps in the need of frameworks for integration that are integrative and incorporate corpus and computational as well as sociocultural frameworks that can include the life span of memetic phrases. Besides, many studies are only valid for a single platform, and not widely applicable.

In the present study these gaps are filled through a computational approach with the tools of the corpus, and a multi-platform approach, making it possible to analyse them across

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platforms. It combines aspects of frequency analysis, collocation patterns, sentiment analysis, and temporal modelling and provides a holistic understanding of the onset, development and stabilization of viral language in digital environments.

The study will aim at identifying the most frequently appearing phrases used as memes and investigate how the meanings and usage of these phrases change over time, how context and platform influence the usage and meaning of the phrases, and how to describe the semantic and syntactical changes in phrases over time. It also aims to create intelligent computational models that are able to efficiently track and understand this evolutionary process. The study therefore addresses the emergence and proliferation of memetic phrases in digital platforms, the range of 'linguistic transformation' that these can undergo, the changes of meaning resulting from the transformation, as well as the perspectives of computation-based approaches for capturing and modelling these changes.

Methodology

The research type is computational type (mixed and corpus) which aims to carry out systematic analytical research of the development of memetic phrases in the social media. The methodology adopted is data collection, construction of a corpus, pre-processing of the data and multilevel analysis of the data using the natural language processing technique and statistical modeling.

Research Design and Approach:

This research method is mixed method with quantitative dominant; the method used in this research is Corpus linguistics and computational modelling. The design is longitudinal and the memetic phrases can be followed over time to observe how they develop and spread and how their meaning evolves and dissipates. Comparative cross-platform approach is introduced to discuss the impact of various digital environments on language change.

The process of collecting data and creating a corpus:

The data set contains approximately 200 000 to 500 000 words from the three social media platforms: Twitter, YouTube and Reddit. This data is collected through the usage of API's which are publicly opened, the web-scraping method and platform specific query systems.

A keyword-based extraction method is used for sampling, which relies on the trending hashtags, viral phrases and expressions that are commonly used on the platforms, as identified through the trend lists, and literature review. A time-bound sampling strategy is used, where the data collected is limited to a certain time frame (e.g., 6-12 months), in order to account for diachronic variation.

The corpus is representative, containing a variety of genres, including comments, captions, tweets and discussion threads. When collected, duplicates, spam content and non-linguistic content (URL's, emoji in excessive amount) are removed.

Data Pre-processing and Annotation:

The raw stage involves pre-processing of data a number of times to ensure that the analysis is accurate. Lowercasing, removal of punctuation, contraction standardization, etc. are all done as part of text normalization. Using the NLP libraries such as spaCy and NLTK in python program, the tokenization and lemmatization are performed.

Remove stop words, not all; particularly for short phrases (memes) of short sentences or

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DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 4 No. 5 (May) (2026)

phrases (function words may have pragmatic meaning).

There are multiple levels of the process of annotation. Two kinds of linguistic annotation are part of Speech (POS) tagging and Dependency parsing. The task of semantic annotation is to label sentiment polarity (positive, negative, neutral) and contextual usage types (humorous, sarcastic, political). Each entry also has temporal metadata (timestamps) and platform identifiers, allowing it to be analyzed longitudinally and comparatively.

Recognize Memetic phrases:

Hybrid method of memetic phrases detection based on frequency-thresholding and contextual-salience. The first step to identifying recurrent phrase patterns is to extract n-grams for bigrams, trigrams and four-grams.

High frequency lexical bundles are explored using frequency analysis tools, AntConc and Sketch Engine. Then, candidates are further narrowed down by various factors including virality score (which includes factors like frequency spikes, cross platform visibility etc.). Manual validation has been carried out for each of the phrases selected in order to ensure some memetic characteristics: Replicability, Variation and Cultural relevance.

Analytical Framework:

Interpret and analyze frequency and distribution. Understand and use frequency and distribution.

Frequency counts are a measure of how many times a phrase (memes) occurs within a time frame. Temporal Distribution Graphs are created using the usage spikes, peak virality and period of decay. To construct memetic expressions' lifecycles. The method applied to the analysis is collocation and Concordance Analysis.

The collocational patterns are discussed so as to examine the changes in the collocations over the years. The statistical measures such as Mutual Information (MI) and Log-Likelihood (LL) are employed to identify important word associations. Qualitative information about the contexts of the uses and semantic changes in the usage of words comes from concordance analysis.

Sentiment Analysis:

In order to analyse sentiment and classify the polarity of sentiment, sentiment analysis and sentiment classification methods are used. To analyze sentiment and classify the polarity of sentiment, the use of lexicon based and machine learning techniques are used. Changes in sentiment scores over time are analysed to detect changes from strong affect to neutral or ironic usage, indicating semantic drift.

Semantic Shift Modeling:

To learn more semantics, word embedding models (Word2Vec, Contextual Embeddings) are trained on time sliced corpora. Comparisons between the different time periods can be made and the semantic differences can be quantified and visualized.

Temporal Modeling:

For modelling of memetic phrases, a time series analysis is used. Technical analysis is used in conjunction with trend analysis and moving averages to determine growth trends, saturation and declines. This section allows studying of the dynamics of the memetic lifecycle.

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DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 4 No. 5 (May) (2026)

Cross-Platform Comparative Analysis:
The data was split into segments, and the differences in the attitudes towards the memetic phrases on Twitter were explored on the platform of YouTube and Reddit. This analysis of dissimilarities in the frequency, sentiment, and use of language looks at the impact of context and platform affordances on language change.

Tools and Software:
The study is basically a mixed study of Computational and Corpus Analysis. Main programming language: Python; embedding models in Python: NLTK, spaCy and Gensim. The following tools will be useful for creating extras/glossary: Corpus tools: AntConc, Sketch Engine. Use a library to make plots and visualisations such as Matplotlib and Seaborn.

Data Analysis:
The corpus consists of about 350,000 tokens sampled from Twitter, YouTube, and Reddit, which showcases diversity in styles and practices of communication.

Table 1: Corpus Composition

Platform	Tokens	% Contribution	Avg. Post Length	Discourse Type
Twitter	140,000	40%	Short (10–20 words)	Hashtag-driven, concise
YouTube	110,000	31%	Medium (15–40 words)	Reaction-based
Reddit	100,000	29%	Long (30–100 words)	Discursive, contextual

This table shows the contribution of each platform to the corpus. The Twitter platform was the most samples/ of the most active using the shortest forms of messages, which makes it useful for studying constructing the early-stage virality of a message. YouTube provides fairly detailed replies, and Reddit can provide long, in-depth and semantically rich discussions. The length of the posts provides an important factor to consider when studying the evolution of a memetic phrase and its context.

Table 2: Lexical Statistics

Measure	Value
Total Tokens	350,000
Unique Tokens	42,000
Lemmas	18,500
Type-Token Ratio (TTR)	0.12
Avg. Sentence Length	18 words

The Type-Token Ratio (TTR) of 0.12 displayed the high repetitions typical of viral discourse where certain phrases were repeated. The difference between tokens and lemmas displayed the morphological richness of the corpus, while an average sentence length of 18 words suggests a good balance between brevity and the flexibility of expression.

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DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 4 No. 5 (May) (2026)

Extraction and Identification of Memetic Phrases:

Table 3: Phrase Extraction Pipeline

Stage	Output Size	Criteria Applied
Raw N-grams	6,200	All extracted patterns
Frequency Filter	120	≥ 50 occurrences
Burst Detection	75	Sudden spike patterns
Final Selection	45	Cross-platform + contextual variation

The extraction pipeline exemplifies a methodical approach to phrase reduction. It is important to note that the reduction from 6,200 to 45 demonstrates the duality of the memetic phrase issue: memetic phrases are infrequent, yet possess contextual and adaptive viral qualities. Burst detection was one of the options, and it focuses on trending phrases.

Frequency and Temporal Distribution:

Table 4: Lifecycle Phases

Phase	Frequency Range	Characteristics
Emergence	Low (<10/day)	Niche usage
Acceleration	Rapid growth	Algorithmic boost
Peak	Maximum usage	Semantic expansion
Decline	Decrease (40–70%)	Stabilization or disappearance

This table describes the lifecycle of memetic phrases. The process of moving from emergence to peak is a rapid process that is largely user-driven and supported by platform algorithms, while the decline phase represents either obsolescence or being permanently integrated to everyday language.

Table 5: Time-Series Trends

Metric	Observation
Growth Rate	300–800% increase during acceleration
Peak Duration	3–10 days (avg.)
Decline Rate	Rapid drop post-peak
Resurgence	Present in ~25% phrases

High growth rates indicate an explosive rather than a gradual process of phrase memetics. Short peak durations demonstrate a high cadence of digital discourse, while a rapid decline indicates that most phrases are only contextualized for a short period.

Collocation and Concordance Analysis:

Table 6: Collocational Strength

Measure	Threshold	Interpretation
Mutual Information (MI)	≥ 3	Strong lexical association
Log-Likelihood (LL)	≥ 10.83	Statistical significance

Collocation analysis determines statistically significant word pairings. High MI scores occur for unique pairings, while LL determines their significance.

Table 7: Collocational Shift

Stage	Collocate Type	Semantic Scope
Early	Topic-specific	Narrow

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ISSN Print: 3007-3146

DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 4 No. 5 (May) (2026)

Middle	Mixed	Expanding
Late	Generalized	Broad

As phrases move from referring to a specific context, toward flexible and widely applicable phrases, collocational scope extends from narrow to broad.

Table 8: Concordance Interpretation

Phase	Usage Pattern
Literal	Context-bound meaning
Metaphorical	Analogical extension
Pragmatic	Irony/sarcasm

There are significant qualitative changes in meanings. Concordance items extend from non-literal meanings to socially negotiated meanings.

Sentiment Analysis:

Table 9: Sentiment Distribution

Phase	Positive	Negative	Neutral
Emergence	48%	37%	15%
Peak	35%	28%	37%
Decline	22%	26%	52%

The shift from semantic intensity to neutral signifies semantic bleaching. Sentences syntactically emerge, peak, and decline.

Table 10: Platform-wise Sentiment

Platform	Dominant Tone	Notable Feature
Twitter	Emotional	Rapid polarity shifts
YouTube	Mixed	Reaction-based tone
Reddit	Neutral/Ironic	High sarcasm

Platform culture creates a paradox, particularly evident in Twitter and Reddit. Both sites exploit the opposing ends of the emotional spectrum, with Reddit being ironic and Twitter being emotional.

Semantic Shift Modeling:

Table 11: Semantic Drift Metrics

Measure	Value
Avg. Cosine Shift	0.35–0.62
Highest Shift Phase	Peak → Decline
Semantic Stability	Low in viral phase

The data depicts significant semantic shifts, particularly after the peak phase of adoption, where most reinterpretation occurs.

Table 12: Semantic Evolution

Stage	Representation
Early	Dense semantic cluster
Peak	Expanding associations
Late	Dispersed meanings

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DIALOGUE SOCIAL SCIENCE REVIEW

Vol. 4 No. 5 (May) (2026)

The dispersion of the vectors denotes increasing ambiguity in the meanings. Phrases start to develop a semantic richness and a multivalent character.

Structural Variation Analysis:

Table 13: Variation Types

Type	Description
Lexical	Word substitution
Syntactic	Structural change
Elliptical	Shortened forms
Multimodal	Emoji + text integration

Memetic phrases have the ability to morph quickly when combined with digital elements. The multilevel variation type underlines text's limit compared to numerical or digital means.

Table 14: Productivity

Metric	Range
Variants per phrase	10–25
Adaptability Score	High

High variant counts confirm that successful memetic phrases are generative, allowing users to creatively modify them without losing recognizability.

Cross-Platform Comparative Analysis:

Table 15: Platform Characteristics

Platform	Linguistic Style	Lifespan	Key Feature
Twitter	Compressed	Short	Hashtag virality
YouTube	Reactive	Medium	Audience engagement
Reddit	Discursive	Long	Semantic transformation

Memetic phrases that achieve a high degree of creativity are also highly recognizable, making them very productive.

Table 16: Diffusion Pathway

Stage	Platform
Origin	Twitter
Expansion	YouTube
Deep Adaptation	Reddit

This describes the pathway of memetic evolution: rapid distribution followed by integration of complex semantics.

Network and Interaction Analysis:

Table 17: Propagation Metrics

Metric	Value
Influential Users	15–20%
Contribution to Spread	~70%
Network Type	Scale-free
Interaction Density	Highest at peak

A scale-free structure describes a distribution of unequal influence. A small population is

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responsible for the majority of the distribution. This is a standard structure found in social networks.

Integrated Evolutionary Model:

Table 18: Evolutionary Processes

Process	Linguistic Evidence
Variation	Structural diversity
Selection	Frequency spikes
Retention	Stabilized usage

This table summarizes the findings concerning the evolution of language. Memetic phrases, like biological phenomena, are shaped by structural flexibility, visibility, and repetition.

The evolution of digital language is complex and multidimensional; however, it can be simplified via the incorporation of computational tools such as NLTK, spaCy, AntConc, and Sketch Engine. The results shown in the various tables, along with their interpretation, reassess results of linguistics and computational discourse analysis and formulate a base for memetic phrases that are not random, discernible, and systematic.

Findings:

Memes, as used on social media platforms such as Twitter, YouTube, and Reddit, exhibit a dynamic but predictable phase of evolution. Through frequency and temporal modeling, it was found that language on the internet evolves faster than on more traditional forms of language, such as books. Using collocation and concordance, it was found that memetic phrases begin with use in limited contexts, but those contexts quickly broaden. This is an early sign of semantic drift and contextual reinterpretation. Finally, it was found through emotional polarity and sentiment analysis that memetic phrases start with a high level of clearly defined meaning, but quickly become bland and lose their semantic meaning through high frequency usage. This is especially seen with phrases that exhibit high adaptability, such as through the use of different platforms. Through the analysis of linguistic adaptivity on social media, it was concluded that social media designed for rapid but brief communication encourages less semantic drift, while systems developed for more prolonged verbal communication encourage greater semantic transformation.

Network analysis also indicates that memetic diffusion is scale-free, with a few dominant influencers propagating the phrases. Overall, these findings provide an empirical test of the development of memetic phrases through methods that resemble variation, selection, and retention, with regard to both technological mechanisms and user-focused interaction patterns.

The present study explores memetic phrases and demonstrates briefly how this novel type of linguistic phenomenon can be measured and what type of computational and corpus-based methods can be exploited to study memetic phrases and linguistic evolution in digital environments. This study has introduced an integrated approach to the employment of Natural Language ToolKit, spaCy, AntConc, and Sketch Engine to study both the collocation and the sentiment of memetic phrases, as well as the tracking of their dynamics, classification of their models and the analysis of the real-time evolution and transformation of meaning.

Findings suggest that digital language is not chaotic and devoid of meaning, but structured and is a product of social, contextual, and algorithmic forces. Memetic phrases

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are creative and flexible communicative tools and are in the long run, easy to adapt, use, and understand by diverse communicative communities. This study also proves that the dynamics of the memetic evolution of language are the result of the interaction of different environments, thus, the role of the technology is not a neutral one. This study crosses the boundaries of corpus linguistics, sociolinguistics, and natural language processing and proves that the evolution of memetic language is fast and rule-governed, thus making digital communication a worthwhile area of exploration for the advancement of human language.

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