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SECTION I. APPLIED LINGUISTICS

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Ахренова Н. А.¹ 
Сербин В. А.² 

Лингвистика алгоритмической логики виральной
коммуникации

¹ Российский университет дружбы народов имени Патриса Лумумбы
ул. Миклухо-Маклая, 6, г. Москва, 117198, Россия
E-mail: akhrenova-na@rudn.ru
ORCID: 0000-0002-1265-5595

² Московский государственный лингвистический университет
ул. Остоженка, 38, стр. 1, г. Москва, 119034, Россия
«Военный университет имени князя Александра Невского»
Министерства обороны Российской Федерации
ул. Большая Садовая, д. 14, г. Москва, 12300, Россия
E-mail: vietvladimir@gmail.com
ORCID: 0000-0002-8066-2519

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Аннотация: Статья посвящена лингвистическому анализу механизмов вирального распространения контента в условиях алгоритмически управляемой цифровой медиасреды. Актуальность исследования обусловлена трансформацией публичной коммуникации на цифровых платформах, где селекция и масштабирование сообщений все чаще осуществляются на основе формализуемых показателей вовлеченности, а не межличностных связей. Это требует пересмотра традиционных подходов к анализу публичной речи и разработки понятийного аппарата, учитывающего алгоритмическое опосредование дискурса. Проблема исследования заключается в выявлении устойчивых лингвистических характеристик алгоритмически усиленного контента и в описании структуры алгоритмического идиолекта – специфического речевого регистра, адаптированного к критериям платформенного отбора и ранжирования сообщений. Особое внимание уделяется соотношению формальных языковых средств, дискурсивной организации сообщений и метрик, используемых алгоритмами цифровых платформ. Исследование базируется на междисциплинарном подходе, сочетающем методы медиалингвистики, теории коммуникации и прикладного анализа данных. Эмпирическую базу составил корпус из 2000 постов социальных сетей (январь–июнь 2025 года), разделенных на виральную и контрольную подвыборки. В работе применялись количественные методы анализа, включая расчет средней длины предложений, частотности экспрессивных конструкций, автоматизированный анализ тональности текста и контент-анализ прагматических и мультимодальных элементов. Статистическая

значимость различий проверялась с использованием t-критерия Стьюдента и χ^2 -критерия. Результаты показывают, что виральный контент характеризуется синтаксической редукцией, повышенной экспрессивностью, поляризацией тональности, ориентацией на бинарные оппозиции и высокой степенью мультимодальности, существенно повышающей вовлеченность. На основе совокупности выявленных признаков обосновано выделение алгоритмического идиолекта виральности как стандартизированного языкового регистра цифровой коммуникации, оптимизированного под алгоритмические механизмы платформ.

Ключевые слова: Виральная коммуникация; Виральность; Алгоритмический идиолект; Алгоритмически управляемая медиасреда; Цифровой дискурс

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Natalia A. Akhrenova¹ 
Vladimir A. Serbin² 

Linguistics of algorithmic logic in viral communication

¹ RUDN University,
6 Miklukho-Maklaya, Moscow 117198, Russia
E-mail: akhrenova-na@rudn.ru
ORCID: 0000-0002-1265-5595

² Moscow State Linguistic University,
bld. 1, 38 Ostozhenka St., Moscow, 119034, Russia
Prince Alexander Nevsky Military University
of the Ministry of Defense of the Russian Federation,
14 Bolshaya Sadovaya St., Moscow, 123001, Russia
E-mail: vietvladimir@gmail.com
ORCID: 0000-0002-8066-2519

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Abstract: The article presents a linguistic analysis of the mechanisms underlying viral content dissemination in an algorithmically governed digital media environment. The relevance of the study is determined by the ongoing transformation of public communication on digital platforms, where the selection and amplification of messages are increasingly driven by formalized engagement metrics rather than interpersonal social ties. This shift necessitates a reconsideration of traditional approaches to the analysis of public discourse and the development of conceptual tools that account for algorithmic mediation. The research problem lies in identifying stable linguistic characteristics of algorithmically amplified content and in describing the structure of the algorithmic idiolect – a specific speech register adapted to the criteria of platform-based selection and ranking. Particular attention is paid to the relationship between formal linguistic strategies, discursive organization of messages, and the metrics monitored by platform algorithms. The study employs an interdisciplinary

approach combining methods from media linguistics, communication theory, and applied data analysis. The empirical basis consists of a corpus of 2,000 social media posts published between January and June 2025, divided into a viral subset (1,000 posts with the highest engagement indicators) and a control subset (1,000 posts with average engagement). Quantitative methods were applied, including calculation of average sentence length, frequency of expressive constructions, automated sentiment analysis using a neural network model, and content analysis of pragmatic and multimodal elements. The statistical significance of the observed differences was tested using a Student's t-test and a chi-squared test. The results demonstrate that viral content is characterized by syntactic reduction, increased lexical expressivity, polarity of sentiment, reliance on binary oppositions, and a high degree of multimodality, which significantly enhances user engagement. Based on the identified features, the study substantiates the notion of an algorithmic idiolect of virality as a standardized linguistic register of digital communication optimized for platform algorithms.

Keywords: Viral communication; Virality; Algorithmic idiolect; Algorithmically governed media environment; Digital discourse

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Введение

Современная цифровая медиасреда характеризуется не только ростом объемов производимого контента, но и глубокой трансформацией механизмов его циркуляции.

Социальные медиаплатформы, функционирующие на основе алгоритмов рекомендаций, персонализации и ранжирования, существенно изменили саму логику публичной коммуникации. Видимость сообщения и масштаб его распространения все в меньшей степени зависят от структуры социальных связей, и все в большей от алгоритмической обработки пользовательской активности.

В рамках данного исследования мы проводим концептуальное разграничение между вовлеченностью (engagement) и виральностью (virality), которые в платформенной среде выступают как связанные, но различные звенья причинно-следственной цепи.

Вовлеченность понимается как совокупность количественно измеримых поведенческих реакций пользователей на единицу контента (лайк, репост, комментарий, время просмотра). Она является первичным сигналом для

алгоритмов платформ, индикатором начального резонанса сообщения в аудитории.

Виральность трактуется как масштабный и часто нелинейный эффект алгоритмического усиления, запускаемый на основе высоких первичных показателей вовлеченности (Hemsley, 2011). Это не просто сумма репостов, а качественный переход контента в иной режим распространения, при котором платформенные алгоритмы (рекомендательные системы, механизмы попадания в «тренды») начинают активно продвигать сообщение за пределы исходной аудитории подписчиков, обеспечивая ему взрывной охват.

Таким образом, вовлеченность – это причина и триггер, а виральность – следствие и результат в логике алгоритмически управляемой медиасреды. Высокая вовлеченность – необходимое, но не всегда достаточное условие для виральности. Данное разграничение позволяет нам в эмпирической части работы рассматривать отобранные посты с аномально высоким индикатором вовлеченности пользователя (далее – ИВП) не просто как «популярные», а как контент,

уже прошедший первичный алгоритмический отбор и ставший объектом масштабирования, то есть достигший состояния виральности

В результате виральность в платформенной среде приобретает алгоритмически масштабируемый характер. Действия пользователей (просмотры, клики, комментарии) сохраняют значение, но уже не как звенья сетевого обмена, а как сигналы, интерпретируемые алгоритмами ранжирования. Массовое распространение контента все чаще представляет собой не каскад репостов, а вспышку видимости, вызванную решением алгоритма о расширении охвата (Arjona-Martín et al., 2020; Narayanan et al., 2023). На этой основе формируется новая коммуникативная форма – виральная коммуникация, которая представляет собой не спонтанный сетевой эффект, а опосредованный алгоритмами процесс масштабирования контента, в котором платформа и сообщение образуют единый контур производства и распределения внимания.

Такое смещение имеет принципиальные последствия для лингвистического анализа цифровой коммуникации. В условиях алгоритмически опосредованной виральности отбор и усиление контента осуществляются не на уровне смысловой аргументации, а на уровне формализуемых характеристик контента, коррелирующих с показателями вовлеченности. Языковые, композиционные и мультимодальные характеристики сообщения оказываются встроенными в алгоритмическую логику платформ и начинают функционировать как адаптивные инструменты повышения видимости. В результате язык вирального контента приобретает свойства платформенно оптимизированного дискурсивного регистра.

Несмотря на значительный интерес к феномену сетевой диффузии информации, цифровой риторике и алгоритмической

медиации (Leskovec et al., 2007; Jenkins, 2006; Gillespie, 2014; Bucher, 2018; van Dijck et al., 2018; Narayanan, 2023), лингвистические аспекты алгоритмически опосредованной виральной коммуникации разработаны пока недостаточно. Существующие работы фокусируются либо на психологических механизмах распространения контента (Berger, Milkman, 2012), либо на технических принципах функционирования рекомендательных систем (Kitchin, 2017; Narayanan et al., 2023). Отечественные исследования в области медиалингвистики и интернет-коммуникации затрагивают вопросы аттрактивности медиатекста и эмоциональных стратегий воздействия (Вартанова, 2019; Максименко, 2013; Леонтович, 2017; Антонова, 2020; Каминская, 2021; Старовойт, 2021; Крапивин, 2025), однако системный анализ языковых особенностей алгоритмически управляемой виральности практически не проводился.

Данная лакуна определяет актуальность нашего исследования, которое опирается на комплекс теоретических походов: концепцию платформенного детерминизма (Ахренова, 2024; ван Дейк, 2020), теорию аффективных алгоритмов (Bucher, 2018), акторно-сетевую модель (Latour, 2005), теорию диффузии инноваций (Rogers, 1962). Эти рамки позволяют рассматривать виральность как результат взаимодействия платформенного (алгоритмы), дискурсивного (языковые стратегии) и поведенческого (практики пользователей) уровней коммуникации. При этом именно язык выполняет интерфейсную функцию, связывая человеческое сообщение с вычислительной процедурой отбора и масштабирования.

Целью представленного анализа стало выявление и количественная оценка лингвистических характеристик, являющиеся частотными в контенте с высокими показателями вовлеченности. В рамках исследования виральность

рассматривается не как постфактум-метрика популярности, а как результат адаптации языковых и дискурсивных стратегий к условиям платформенного отбора. Особое внимание уделяется анализу морфосинтаксических, лексико-семантических и дискурсивно-прагматических характеристик контента, коррелирующих с высокими показателями вовлеченности, а также формированию алгоритмического идиолекта – надиндивидуального речевого регистра, оптимизированного под алгоритмические механизмы видимости.

В основу исследования была положена рабочая гипотеза о том, что контент с более короткими синтаксическими конструкциями и использованием ряда риторических приемов, например, риторических вопросов, парцелляции, получает более высокий средний уровень вовлеченности аудитории; лексика с высокой эмоциональной валентностью, как положительной, так и отрицательной, и оценочностью способствует повышению виральности контента; поликодовые мультимодальные сообщения (текст + изображение/мем) имеют значимо более высокие показатели охвата и вовлеченности по сравнению с чисто текстовыми.

Таким образом, виральная коммуникация может рассматриваться как объект лингвистического анализа, требующий переосмысления теоретических оснований в свете алгоритмической трансформации цифровой публичности. Далее мы рассмотрим ключевые подходы, определяющие исследовательскую рамку настоящей работы.

Основная часть

Стратификация моделей цифровой коммуникации

Современные исследования цифровой коммуникации сходятся в признании того, что механизмы распространения информации в

медиасреде претерпели принципиальную трансформацию. В классических работах начала 21 века этот сдвиг описывался как переход от подписной (вещательной) к сетевой модели коммуникации. В рамках подписной модели пользователь получал контент от ограниченного круга институциональных источников, а распространение сообщений носило линейный и централизованный характер. Исследования, посвященные теории диффузии инноваций и культуре участия, фиксировали разрушение этой модели и рост роли горизонтальных связей между пользователями (Rogers, 1962; Jenkins, 2006).

С развитием Web 2.0 на первый план вышла сетевая модель коммуникации, в которой пользователь становится не только реципиентом, но и активным ретранслятором контента. Механизмы репостинга и шеринга порождают эффект информационных каскадов, при котором сообщения распространяются по социальной сети за счет последовательных индивидуальных решений пользователей. Именно в рамках этой модели формируется классическое представление о виральности как социальном эффекте, основанном на межличностных связях и добровольном «усилении» контента внутри децентрализованной сети (Leskovec et al., 2007; Nahon et al., 2013).

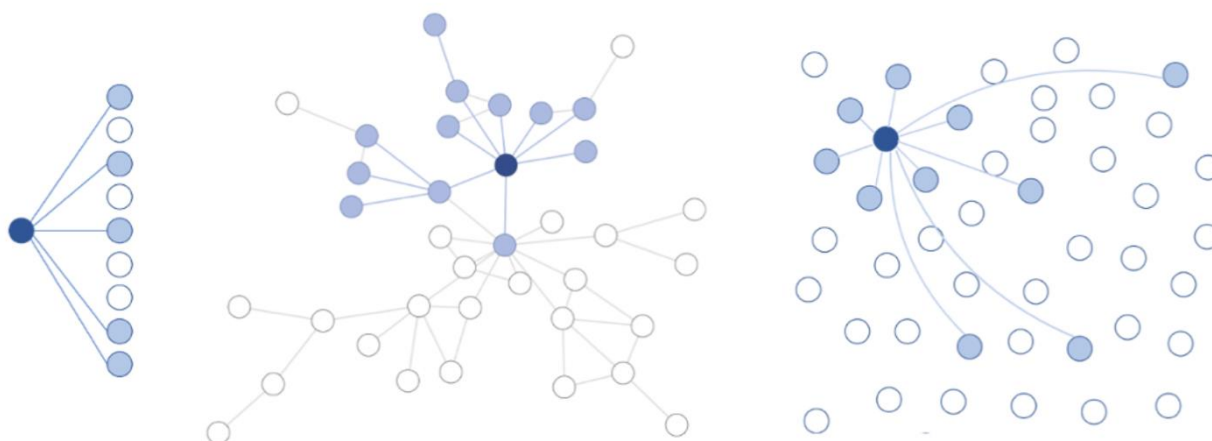
Однако архитектура современных платформ не столько отменила, сколько надстроила новые режимы над старыми. В связи с этим термин «эволюция» требует уточнения: в современной цифровой среде мы наблюдаем не линейную смену, а стратификацию (многослойность) коммуникативных моделей. Подписная модель (follow-модель) продолжает существовать, формируя ядро лояльной аудитории. Сетевая модель (share-модель) опосредует распространение внутри доверительных кругов. Алгоритмическая же модель (rank-модель) выступает метаярмом, который селективно усиливает контент, уже прошедший первичный отбор

в двух первых слоях (Gillespie, 2014; van Dijck et al., 2018). Следовательно, корректнее говорить не об эволюции как замещении, а об усложнении архитектуры цифровой публичности, где

алгоритмическая логика становится доминирующим, но не единственным механизмом распределения внимания, надстраиваясь над подписной и сетевой.

Рисунок 1. Стратификация моделей цифровой коммуникации

Figure 1. Stratification of Digital Communication Models



Таким образом, виральность в современных условиях перестает быть исключительно сетевым эффектом и все чаще выступает результатом алгоритмического усиления, при котором платформа активно участвует в принятии решений о масштабировании сообщения.

Эволюция понятия виральности: от биологической метафоры к платформенной логике

Понятие виральности исторически формировалось на основе биологической метафоры заражения. В работах Р. Докинза и Д. Рашкоффа идеи и медиатексты рассматривались как культурные вирусы, самопроизвольно распространяющиеся в социальной среде (Dawkins, 1976; Rushkoff, 1994). Причем Рашкофф подчеркивал, что говорит о вирусах не метафорически, а буквально – медийные события, по его мнению, и есть вирусы. Такая трактовка предполагала относительную пассивность аудитории и автономность вирусного контента.

Критика данной модели была развернута в исследованиях Г. Дженкинса, С. Форда и Д. Грина, которые показали,

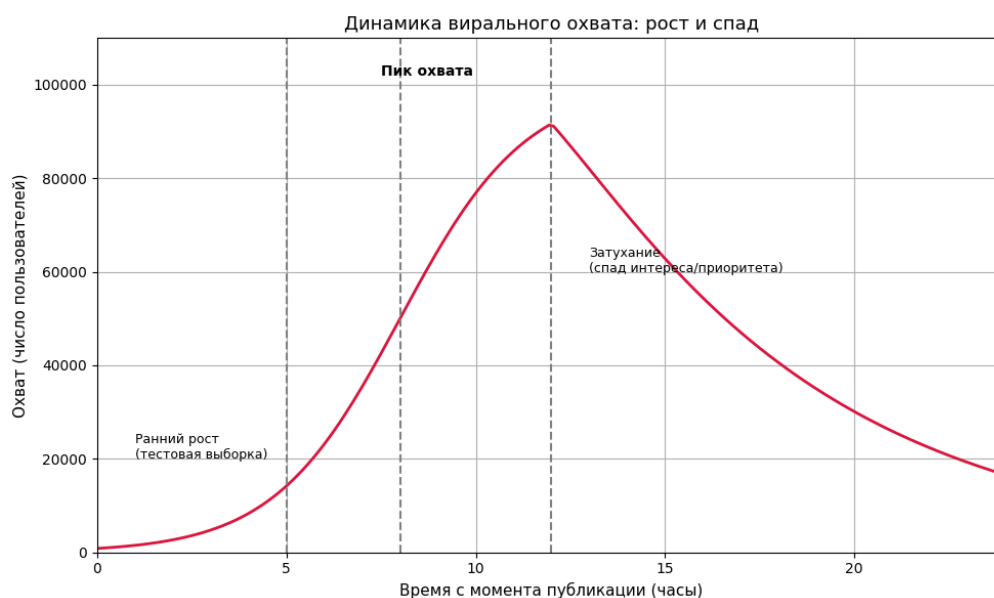
что распространение контента невозможно без активного участия пользователей и их культурной переработки сообщений (Jenkins et al., 2013). Взамен вирусной метафоры ими была предложена концепция “spreadability” (распространяемости), подчеркивающую роль аудитории в сознательном перенаправлении сообщений. То есть идеи и контент распространяются, только если люди находят их значимыми, вписанными в их культурный контекст и техническую среду, и сознательно делятся ими.

В российской научной традиции аналогичные идеи развивались через понятия аттрактивности медиатекста, презентационности и эмоционального усиления (Максименко, 2013; Леонтович; 2017; Антонова, 2020; Каминская, 2021). Виральность описывали также как принцип презентационности и эмоционального усиления контента, то есть стремление подать информацию так, чтобы она сразу производила эффект и побуждала делиться (Вартанова, 2019; Старовойт, 2021; Крапивин, 2025).

Современные исследования фиксируют переход к гибридному пониманию виральности, возникающей на стыке пользовательской активности и алгоритмической селекции. Обзорные работы показывают, что в платформенной среде массовое распространение контента все чаще представляет собой не цепочку репостов, а алгоритмически инициированную вспышку видимости (Arjona-Martín et al., 2020; Narayanan et al.,

2023). Алгоритмы могут усиливать контент, опираясь на ранние показатели вовлеченности, даже без многошагового «сарафанного радио». В результате традиционная метафора вируса утрачивает самостоятельность: виральность теперь во многом инфраструктурно обусловлена. Она определяется не только качествами самого сообщения или волей публики, но и параметрами платформы, в рамках которой это сообщение циркулирует.

Рисунок 2. Динамика вирального охвата
Figure 2. Dynamics of Viral Reach



Алгоритмически управляемая медиасреда

Современная цифровая медиасреда функционирует по принципам алгоритмического управления, при котором автоматизированные платформы активно отбирают и ранжируют контент. Алгоритмы социальных сетей и агрегаторов выступают не нейтральными каналами, а полноправными акторами коммуникации, определяя, какой материал станет видимым для широкой аудитории (Gillespie, 2014; Bucher, 2018). Публичное высказывание в такой среде начинает зависеть не столько от его содержания, сколько от соответствия алгоритмическим приоритетам платформ. Иными словами, алгоритмическая логика цифровых

платформ формирует новое «правило игры» для медийного дискурса: механизмы платформ задают условия распространения информации и модулируют внимание пользователей (Kitchin, 2017).

При этом алгоритмическое управление не носит полностью автономного характера. Критические исследования подчеркивают встроенность алгоритмов в институциональные, экономические и культурные контексты, а также их зависимость от человеческих решений на этапах проектирования, настройки и интерпретации данных. Тем самым автономность алгоритмических систем оказывается ограниченной, а их воздействие — опосредованным

социальными и политическими факторами (Ananny, Crawford, 2018; Kitchin, 2017).

Алгоритмически управляемая медиасреда существенно влияет на язык и стиль производимого контента. Во-первых, алгоритмы все чаще определяют, что будет распространяться. Мы наблюдаем алгоритмический поворот в селекции новостного контента – вместо человеческих редакторов видимость сообщений обеспечивают вычислительные правила ранжирования (Gillespie, 2014). Во-вторых, авторы медиатекстов начинают сознательно подстраивать свои высказывания под критерии алгоритмической видимости, избегая тем самым «угрозы невидимости» в ранжированном потоке (Bucher, 2018). В результате наблюдается смещение риторики в сторону клипового, экспрессивного изложения, рассчитанного на мгновенное привлечение внимания: короткие броские заголовки, эмоционально насыщенные слоганы, кликбейт-формулы стали нормой вирусного контента (Антонова, 2020; Старовойт, 2021). Тексты упрощаются семантически и фрагментируются структурно, дополняются визуальными элементами и эмодзи – все это повышает их шансы быть подхваченными алгоритмом в условиях беглого онлайн-потребления. Эмпирические данные подтверждают эффективность подобных стратегий: эмоционально резонансные и когнитивно простые сообщения статистически чаще получают высокий виральный охват (Berger, 2013). Кроме того, алгоритмическая фильтрация контента приводит к фрагментации информационного пространства и формированию эффекта «эхо-камер» и пузырей фильтров (Pariser, 2011). Все это указывает на необходимость учитывать алгоритмический фактор как особый параметр анализа медиатекстов. Без него исследователь рискует упустить целое измерение современных медиапроцессов.

В рамках критической теоретической традиции алгоритмически управляемая медиасреда рассматривается как пространство алгоритмического посредничества, в котором автоматизированные системы не только ранжируют информацию, но и перераспределяют агентность между людьми и технологиями, формируя новые режимы власти, ответственности и контроля над публичной видимостью (Introna, 2016; Amore, 2020; Roumbanis, 2025). В российской научной традиции близкие процессы осмысляются в рамках критической лингвистики и медиалингвистики, где анализируются властные и идеологические эффекты публичной риторики; однако алгоритмический фактор в этих исследованиях до последнего времени рассматривался преимущественно имплицитно (Чернявская, 2017; Клушина и др., 2024).

Значимый вклад в расширение теоретической рамки вносит и внеевропейская академическая перспектива. Так, Цюань Янь рассматривает алгоритмы как активных медиопосредников, формирующих информационную архитектуру на трех уровнях: метауровне (правила видимости и модерации), мезоуровне (отбор тем и фреймов) и микроуровне (форматирование и упрощение сообщений). Хотя данная концепция не ориентирована непосредственно на анализ языковых структур, она позволяет рассматривать алгоритмы как риторических агентов, задающих условия появления, продвижения и восприятия публичного высказывания еще до его публикации (Quan Yan, 2023a, Quan Yan, 2023 б).

Алгоритмический идиолект

Одним из следствий алгоритмизации медиасферы становится формирование алгоритмического идиолекта – устойчивого речевого регистра, адаптированного к механизмам платформенного отбора и основанного на

статистически эффективных языковых стратегиях, которые повышают вероятность алгоритмического усиления. Его становление обусловлено, с одной стороны, бессознательной адаптацией пользователей к алгоритмическим правилам видимости, а с другой – непрерывным обучением алгоритмов на поведенческих, аффективных и лингвистических сигналах (Bucher, 2018; Gillespie, 2014; Dillet, 2020).

Введение термина «алгоритмический идиолект» может вызвать закономерный вопрос о его субъектности, учитывая классическую трактовку идиолекта как совокупности особенностей речи отдельного индивида. В данном случае мы намеренно используем этот термин, фиксируя парадокс современной коммуникации: алгоритмическое давление приводит к формированию стандартизированного, надындивидуального речевого регистра, который, однако, имитирует идиолектные черты – индивидуализированную манеру, эмоциональность, спонтанность. Субъектом, «продуцирующим» этот регистр, выступает не конкретный человек, а гибридный актер – пользователь, чья речевая практика бессознательно или сознательно оптимизируется под алгоритмические фильтры. Таким образом, алгоритмический идиолект – это не речь алгоритма, а речь, оптимизированная для алгоритма. Его «идиолектность» представляет собой симулякр индивидуальности, возникающий в результате массового копирования речевых паттернов, успешных с точки зрения алгоритмической селекции.

В отличие от классического идиолекта, отражающего уникальные особенности речи отдельного носителя языка, алгоритмический идиолект воспроизводит стандартизированный стиль, оптимизированный под критерии платформ. Он характеризуется синтаксической редукцией, эмоциональной насыщенностью,

мультимодальностью и опорой на повторяемые триггерные конструкции – хештеги, мемы, слоганы, визуально-текстовые гибриды. Исследования показывают, что именно такие элементы обеспечивают наибольшую вовлеченность и, как следствие, распространение контента (Dillet, 2020; Ахренова, 2025).

Таким образом, интеграция отечественных и зарубежных подходов позволяет рассматривать виральную коммуникацию как алгоритмически опосредованный дискурсивный процесс, в котором язык выступает ключевым интерфейсом между человеческим восприятием и машинной логикой отбора. Виральность в этом контексте перестает быть случайным или исключительно социальным эффектом и становится результатом системной адаптации языковых стратегий к условиям платформенной медиасреды. Понимание алгоритмического идиолекта как адаптивного регистра, возникающего на пересечении человеческой речевой практики и алгоритмической селекции, открывает новые перспективы для лингвистического анализа цифровой коммуникации и служит индикатором трансформации публичной речи в условиях алгоритмически управляемой медиасреды.

Предлагаемый теоретический синтез создает основу для лингвистического анализа вирального контента, ориентированного не только на описание отдельных приемов, но и на выявление устойчивых закономерностей алгоритмического идиолекта.

Материалы и методы

В рамках данного исследования виральность трактуется как алгоритмически опосредованная форма масштабирования контента, при которой расширение охвата определяется взаимодействием пользовательской активности и платформенных механизмов ранжирования. Высокий уровень

вовлечённости интерпретируется как результат алгоритмической селекции, а не как прямое следствие сетевой диффузии.

Для операционализации этого феномена используется следующая формула определения вирального потенциала (VP):

$$VP = E \times C \times T \times A$$

где:

E (*Emotional Appeal*) – эмоциональная привлекательность или степень аффективного воздействия контента;

C (*Cognitive Simplicity*) – когнитивная доступность, т.е. легкость восприятия и понимания сообщения (измеряется через синтаксическую и семантическую простоту);

T (*Timing*) – актуальность контента временному контексту;

A (*Algorithmic Affinity*) – алгоритмическое соответствие, степень оптимизации под механизмы ранжирования платформ. Каждая компонента нормирована в диапазоне 0–1.

Данная модель служит теоретической рамкой для интерпретации эмпирических результатов на всех трёх уровнях анализа.

С целью проверки нашей гипотезы было сформирован корпус из 2000 текстовых постов в социальных сетях за период с января по июнь 2025 года. Эмпирическую базу составили публикации из двух наиболее популярных в русскоязычном сегменте платформ с доминированием алгоритмической ленты: ВКонтакте, Telegram (публичные каналы). Выбор платформ обусловлен их различной медийной архитектурой: ВКонтакте сочетает социальный граф и алгоритмическую ленту рекомендаций («Умная лента»); Telegram-каналы представляют собой гибрид подписной модели с элементами алгоритмического продвижения через тематические рекомендации. Отбор производился исключительно из публичных источников – пабликов, публичных личных страниц с открытыми метриками и публичных

каналов, что позволило верифицировать данные о вовлеченности. Из выборки исключались посты из закрытых групп и частных аккаунтов. Для минимизации влияния платформенной специфики на итоговые выводы стратификация осуществлялась пропорционально доле вирального контента, обнаруженного на каждой платформе за исследуемый период. Такой дизайн, при сохранении доминирования общих лингвистических паттернов, позволяет в первом приближении говорить об универсальности выделяемого алгоритмического идиолекта, оставляя перспективу для кросс-платформенного сравнительного анализа.

Для отбора единиц корпуса использовался интегральный показатель вирального потенциала (ИВП), рассчитываемый для каждого поста отдельно по формуле:

$$ИВП = (L / L_{avg}) \times 0.3 + (R / R_{avg}) \times 0.4 + (C / C_{avg}) \times 0.3$$

где:

L, R, C – абсолютные значения лайков, репостов и комментариев у конкретного поста;

L_avg, R_avg, C_avg – средние значения соответствующих реакций для данной тематической группы и платформы за анализируемый период (январь–июнь 2025 г.). Весовые коэффициенты (0.3, 0.4, 0.3) отражают приоритет распространения (репост) как ключевого маркера виральности над одобрением (лайк) и дискуссией (комментарий).

Принципиальным для дизайна исследования является вопрос о репрезентации виральности через показатели вовлечённости. Как отмечалось выше, виральность – это эффект алгоритмического масштабирования, запускаемый на основе высокой вовлечённости. В условиях закрытости «чёрного ящика» (*black box*) платформенных алгоритмов прямые данные о факте и моменте алгоритмического усиления недоступны

для внешнего наблюдателя. В связи с этим в настоящем исследовании применяется метод обоснованной аппроксимации: контент с аномально высоким ИВП (более 3.0) рассматривается как уже прошедший стадию алгоритмического усиления. Логика данного допущения базируется на том, что столь кратный (трехкратный и выше) отрыв от среднестатистических показателей вовлеченности в своей тематической нише не может быть объяснен исключительно «органическим» сетевым распространением среди подписчиков и с необходимостью предполагает вмешательство рекомендательных систем, выведших контент на массовую аудиторию. Таким образом, экстремально высокая вовлеченность выступает в нашем исследовании операциональным индикатором состоявшейся виральности.

Корпус разделен на две равные подвыборки по 1000 текстов каждая.

Группа 1 (виральная): 1000 постов, чей ИВП превышал 3.0, то есть демонстрировавших как минимум трехкратное превышение нормативных для своей ниши показателей вовлеченности. Данный порог был установлен эмпирически на основе анализа распределения ИВП во всем предварительном датасете и позволил отсеять локально популярный контент, выделив посты с аномально высокой скоростью и масштабом распространения.

Группа 2 (контрольная): 1000 постов, отобранных для обеспечения репрезентативного фонового сравнения. Значение ИВП каждого поста находилось в диапазоне от 0.8 до 1.2, то есть демонстрировало вовлеченность, близкую к среднестатистической для их тематического кластера и платформы. Такой подход позволил исключить как аномально популярные, так и полностью незамеченные публикации, сформировав выборку типичного, «рядового» контента. Для минимизации тематического смещения отбор проводился

стратифицированно: из каждого из пяти тематических кластеров было случайным образом выбрано по 200 постов, удовлетворяющих указанному диапазону ИВП. Таким образом, контрольная группа репрезентирует стандартные лингвистические практики в исследуемых сегментах цифрового дискурса при отсутствии значимого алгоритмического усиления.

Общий объем корпуса составил около 2 млн символов, по 1000 текстов в каждой группе, сбалансированных по тематике и условиям распространения.

Необходимо оговорить методологическое ограничение, обусловленное спецификой объекта. Идеальная экспериментальная схема предполагала бы сравнение двух групп постов с одинаково высокой вовлечённостью, одна из которых получила алгоритмическое усиление (вошла в рекомендации), а другая – нет. Однако в реальных условиях функционирования платформ такое разделение для внешнего исследователя невозможно: факт алгоритмического усиления не является публично маркированным параметром, а составляет часть внутренней логики платформы. Высокая вовлечённость и алгоритмическое усиление в современной медиасреде связаны циркулярной причинностью: алгоритмы усиливают то, что увлекает, а усиление, в свою очередь, генерирует ещё большую вовлечённость. В связи с этим принятый в работе дизайн – сравнение постов с аномально высоким ИВП и постов со средним ИВП направлен на выявление лингвистических маркеров, коррелирующих с попаданием контента в «петлю усиления». Мы исследуем не столько результат однократного алгоритмического решения, сколько лингвистические свойства контента, который с наибольшей вероятностью становится объектом такого решения. Выделение «чистой» группы алгоритмически усиленных постов

представляет перспективную задачу для дальнейших исследований, реализуемую лишь при коллаборации с платформами и доступе к их внутренней аналитике.

Исследование носит комплексный характер и включает многоуровневый лингвистический анализ контента. Мы предлагаем трехступенчатую процедуру анализа: 1. Морфосинтаксический уровень (количественный анализ) – изучение формальных синтаксических характеристик сообщений. 2. Лексико-семантический уровень – анализ словарного состава, тональности и содержательных маркеров. 3. Дискурсивно-прагматический уровень – анализ способов подачи сообщения, его прагматических компонентов (мульти-modalность, призывы, хэштеги и др.).

На первом уровне (морфосинтаксис) мы измеряли ряд ключевых формальных показателей, предполагая, что вирусный контент склонен к упрощенным, динамичным формам: - Средняя длина предложения (в словах) – рассчитывалась по каждому тексту и усреднялась по группе. - Длина заголовка или первой фразы – ряд исследований указывает, что короткие, броские заголовки лучше привлекают внимание. - Частота риторических вопросов – доля сообщений, в которых автор использует вопросительные предложения без ожидания ответа (например, "Знаете ли вы, что...?" в начале поста). - Частота парцелляции – случаев расчленения фразы на несколько коротких интонационно-смысловых фрагментов (прием, создающий эффект устной речи и эмоциональности). – Частота инверсии – нестандартного порядка слов, используемого для акцента (например, вынесение дополнения или сказуемого в начало).

Для автоматизированного сбора этих метрик мы использовали инструменты Python: библиотеку `rumorphy2` для морфологического анализа (определение

границ предложений, подсчет слов), а также авторские скрипты для поиска риторических вопросов (регулярные выражения по символу "?"), парцеллированных конструкций (выявление аномально коротких предложений, следующих после точки или вопросительного знака), инверсий (по ключевым порядкам слов в русском предложении). Данные автоматически полученные метрики дополнялись ручной разметкой выборки для валидации спорных случаев. Статистическое сравнение групп проведено с помощью критериев: t-тест Стьюдента для средних (длина предложений и заголовков) и χ^2 (хи-квадрат) для долей категориальных признаков (наличие риторического вопроса, парцелляции, инверсии). Уровень значимости устанавливали $p < 0,05$. Также вычислялись оценки размера эффекта: разница средних выражалась через коэффициент Коэна d , для ϕ коэффициент использован ϕ для таблиц сопряженности 2×2 .

На втором уровне (лексико-семантический) мы исследовали особенности словаря и семантики вирусных сообщений.

Проведен частотный анализ лексики обеих групп с выявлением слов, статистически значимо чаще встречающихся в вирусной группе. Для этого построены списки частотности слов (с предобработкой: тексты очищены от стоп-слов, лемматизированы с помощью морфологического анализатора MyStem). Для построения частотных списков и анализа коллокаций применялся инструмент AntConc. Сравнение частотности конкретных слов выполнялось с помощью χ^2 -теста или точного критерия Фишера (для редких слов) с расчетом отношения шансов (Odds Ratio) – насколько вероятность встретить данное слово выше в вирусной группе, чем в контрольной.

Для анализа тональности использовалась предобученная

нейросетевая модель ruBert-tiny2 (DeepPavlov), классифицирующая тексты на три категории: положительный, отрицательный и нейтральный тона. Валидация и калибровка модели были проведены на ручно размеченной выборке из 500 случайных постов нашего корпуса, не вошедших в основную выборку. Три независимых эксперта-лингвиста присваивали каждому посту доминирующую тональность по заданному гайдлайну. Совпадение оценок экспертов (мера Флейсса каппа) составило $\kappa = 0.78$, что свидетельствует о существенном уровне согласия. Точность (accuracy) модели на этой валидационной выборке, измеренная относительно экспертного консенсуса, составила 87%. Расхождения в основном касались сложных случаев иронии и сарказма, которые затем были учтены при интерпретации количественных результатов. Для повышения надежности, автоматически полученные оценки эмоциональной интенсивности дополнительно проверялись по наличию в тексте лексических маркеров из заранее составленного словаря экспрессивной лексики (например, «потрясающе», «ужас», «разочарование»).

Исследованы бинарные оппозиции в лексике. Мы задали несколько шаблонных пар антонимических понятий, которые по нашей гипотезе могут использоваться как прием (например, «до – после», «просто – сложно», «старое – новое», «правильно – неправильно», «дорого – бесплатно»). С помощью поиска по шаблонам (регулярные выражения и n-граммный анализ) выявлялись случаи явного противопоставления в постах (например, фраза "раньше было сложно, теперь – просто"). Подсчитана доля текстов с таким приемом и наиболее частотные противопоставления.

Наконец, выполнено выявление ключевых тематических триггеров – тем или областей знания, которые особенно характерны для вирусного контента. Для

этого все тексты были подвергнуты тематическому классифицированию (методом topic modeling LDA – латентное размещение Дирихле, число тем ~ 10). Однако для интерпретации результатов мы также вручную сгруппировали самые распространенные хештеги и ключевые слова по темам (например, тема "технологии/ИИ", "здоровье/биохакинг", "космос" и т.д.) и рассчитали среднюю вовлеченность постов на эти темы. Цель – обнаружить, есть ли специфические «горячие» темы, резко повышающие шансы на вирусность.

На третьем уровне (дискурсивно-прагматический) рассмотрены особенности подачи вирусных сообщений и дополнительные кодовые системы.

Проанализирована поликодовость контента, то есть использование помимо текста других медиаресурсов: изображений, видео, мемов, инфографики. По каждому посту отмечено, содержит ли он вложенное изображение/картинку, видео или только текст. Далее сопоставлено распределение типов контента в обеих группах (процент чисто текстовых постов vs. постов с мультимедиа). Также рассчитаны средние показатели вовлеченности для разных форматов (например, текст+мем, текст+видео и т.д.), чтобы выявить наиболее эффективный формат.

Проведена классификация и оценка мемов как особого жанра контента. В тех постах вирусной группы, где присутствовал мем (изображение с подписью, или шаблонное массовое изображение), мемы отнесены к функциональным типам: юмористические, объясняющие, провокационные, мобилизующие и др., по нашей авторской типологии. Для каждого типа посчитана доля среди всех мемов и средняя вовлеченность, чтобы понять, какой тип мемов более «вирусный».

Исследовано использование хештегов – одного из ключевых инструментов цифровой риторики. Мы подсчитали

среднее число хэштегов на пост в каждой группе, долю постов без хэштегов, а также отдельно выделили хэштеги оценочного характера (эмоциональные, призывные, маркирующие оценку, например #шок #гениально #mustread). Построено облако наиболее популярных хэштегов в вирусной группе. Далее хэштеги классифицированы по прагматической функции: тематические (обозначающие тему: #наука, #технологии), оценочные (#удивительно, #шок), призывные (#узнайПервым, #делись), идентификационные (#нашПроект, #мыКоманда). Эта классификация введена для понимания, как авторы используют хэштеги – просто для темы или как средство вовлечения.

Наконец, проведен корреляционный анализ между обнаруженными параметрами (наличие мема, число хэштегов, наличие оценочных хэштегов, тип контента и т.п.) и показателями вовлеченности (в пределах всей выборки). Это позволяет количественно оценить вклад каждого фактора.

Все собранные количественные данные обобщены в виде таблиц и графиков. Обработка данных и визуализация выполнены средствами Python (библиотеки pandas, matplotlib). В тексте ниже представлены наиболее значимые результаты с иллюстрациями (таблицы и графики) и их статистическая значимость.

Результаты и обсуждение

1) Морфосинтаксический анализ вирального контента

Для проверки ранее выдвинутой гипотезы были количественно измерены показатели формальной сложности текста и частотности экспрессивных синтаксических средств: средняя длина предложения (в словах), длина заголовка или первой фразы, а также частотность трех экспрессивных синтаксических приемов – риторических вопросов, инверсии и парцелляции.

В нижеприведенной таблице 1 демонстрируется сравнение ключевых

метрик между группами. Как видно, вирусные посты значительно **лаконичнее** по синтаксису, чем обычные: их средняя длина предложений почти на 40% меньше, а заголовки/начальные фразы почти вдвое короче, по сравнению с контрольной группой. Эти различия статистически значимы (t-тест Стьюдента для независимых выборок показал, например, $t(1998)=18.34$, $p<0.001$, Cohen's $d=1.82$ для длины предложений).

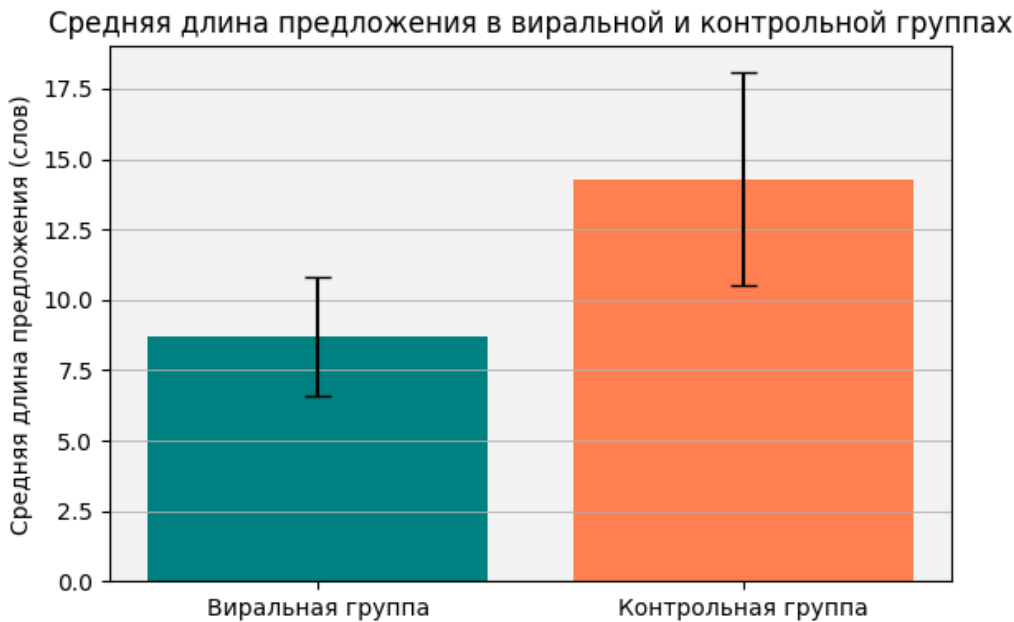
Помимо редукции синтаксической длины, виральный контент демонстрирует значительно более высокую насыщенность экспрессивными синтаксическими приемами. Так, риторические вопросы обнаружены в 34.2% виральных постов против 11.8% в контрольной группе; парцелляция — в 28.7% против 7.3%; инверсия — в 19.5% против 8.9%. По всем трем параметрам различия статистически значимы (χ^2 , $p < 0.01$). При этом размеры эффекта варьируют от среднего до крупного: для риторических вопросов и парцелляции ϕ составляет около 0.21–0.23, тогда как для инверсии — около 0.11. Иными словами, виральный контент гораздо чаще «разговаривает» с читателем через вопросы, нарочито дробит фразы на короткие ударные сегменты и играет порядком слов, тогда как менее популярные посты написаны более нейтрально и развернуто.

Выявленные различия позволяют интерпретировать виральный контент как особый тип текстовой организации, в котором синтаксическая экономия сочетается с повышенной экспрессивностью. Эти тенденции наглядно иллюстрируются схемой 3, где сопоставляется средняя длина предложения в виральной и контрольной группах: визуально фиксируется устойчивый разрыв между группами, подтверждающий количественные данные таблицы 1. Однако различия между группами проявляются не только на уровне формальных характеристик, но и в их связи с пользовательской реакцией.

Таблица 1. Сравнительный анализ метрик
Table 1. Comparative Analysis of Metrics

Метрика	Виральная группа	Контрольная группа	p-value	Эффект
Средняя длина предложения	8.7 ± 2.1 слов	14.3 ± 3.8 слов	< 0.001	Крупный (d = 1.82)
Длина заголовка/первой фразы	5.2 ± 1.8 слов	9.6 ± 2.9 слов	< 0.001	Крупный (d = 1.58)
Риторические вопросы	34.2%	11.8%	< 0.001	Средний (φ = 0.21)
Парцелляция	28.7%	7.3%	< 0.001	Крупный (φ = 0.23)
Инверсия	19.5%	8.9%	< 0.01	Малый (φ = 0.11)

Рисунок 3. Средняя длина предложения в виральной и контрольной группах
Figure 3. Average Sentence Length in Viral and Control Groups



Корреляционный анализ показал, что средняя длина предложения находится в сильной отрицательной связи с вовлеченностью аудитории (коэффициент Пирсона $r = -0.68$, $p < 0.001$), то есть *более короткие фразы ассоциируются с большим числом реакций*. Это согласуется с общими трендами SMM, где более сжатые тексты обычно показывают более

высокий уровень взаимодействия аудитории. Напротив, наличие риторического вопроса положительно коррелирует с вовлеченностью ($r = +0.42$), как и парцелляция ($r = +0.51$) и, в меньшей степени, инверсия ($r = +0.28$), при статистической значимости $p < 0.01$ для всех трех.

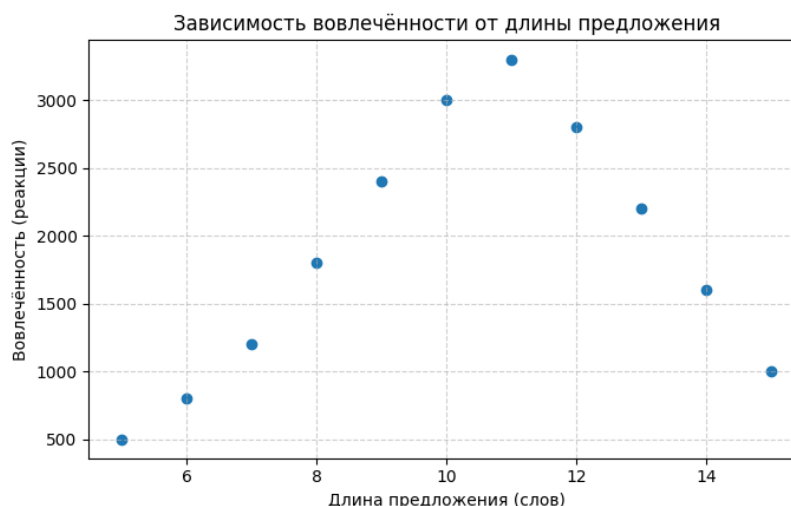
Таблица 2. Корреляция метрик с вовлеченностью
Table 2. Correlation Between Metrics and Engagement

Метрика	r (Пирсон)	p-value
Длина предложения	-0.68	< 0.001
Риторические вопросы	+0.42	< 0.001
Парцелляция	+0.51	< 0.001
Инверсия	+0.28	< 0.01

Иначе говоря, посты, содержащие эти приемы, в среднем получают больше откликов, чем тексты без них. Данная зависимость схематически представлена на

рисунке 4, где показано снижение средней вовлеченности по мере увеличения длины предложения.

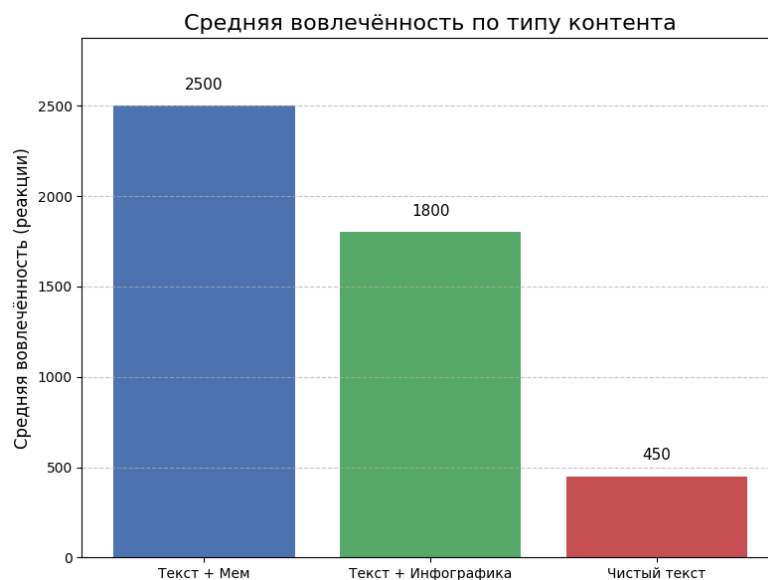
Рисунок 4. Зависимость вовлеченности от длины предложения
Figure 4. Relationship Between Engagement and Sentence Length



Наряду с синтаксическими маркерами, существенную роль в вариативности вовлеченности играет и формат подачи, в том числе наличие визуального компонента. Это отражено на схеме 5, где видно, что сочетание текста с ярким визуальным элементом значительно повышает вовлеченность аудитории и удобство восприятия контента. Так, посты формата «текст + мем» собирали ~2500 реакций в среднем, текст с инфографикой – около 1800. Напротив, чисто текстовые

публикации набирали лишь ~450 реакций. Результаты подтверждают поликодовую природу современного медиатекста. Вирусному распространению контента способствует сопровождение лаконичного текста наглядными мемами или инфографиками, тогда как одиночный текст без визуала редко достигает высоких показателей (На схеме усредненные данные по выборке: для каждого типа контента рассчитано суммарное среднее число реакций).

Рисунок 5. Средняя вовлеченность (количество реакций) в зависимости от типа контента
Figure 5. Average Engagement (Number of Reactions) by Content Type



Полученные количественные закономерности находят подтверждение в качественном анализе типичных текстовых примеров из нашего корпуса. Рассмотрение конкретных публикаций позволяет проследить, каким образом выявленные статистические различия реализуются на уровне реальных речевых стратегий и синтаксической организации высказывания.

Характерным для вирусных текстов является сочетание *риторического вопроса и парцелляции*, выступающее в качестве механизма первичного вовлечения адресата. Так, посты трендового научно-популярного сегмента нередко начинаются с вопроса, который инициирует диалог с читателем, а затем разворачиваются в виде серии кратких, интонационно завершённых фрагментов: «Мы – это то, что мы помним. Но как мы это делаем? И можно ли улучшить память?»; «Почему мы так быстро устаем? Не из-за работы. И не из-за возраста. Причина гораздо ближе, чем кажется»; «А вы уверены, что прокрастинация – это лень? Скорее всего, нет. Это защита. И вот почему». В данных примерах вопросная форма выполняет функцию когнитивного

«крючка» (тж. «хука»), а последующая парцелляция задаёт ритм и поэтапно дозирует информацию, имитируя устную речь. Такая организация текста снижает когнитивную нагрузку и одновременно поддерживает внимание адресата, стимулируя дальнейшее чтение.

Другим устойчивым приемом вирусных публикаций является *инверсия в сочетании с акцентной парцелляцией*. В новостных технологических постах ключевой результат часто выносится в начало высказывания: «Сенсационный прорыв совершили ученые из США...», после чего следует краткое уточнение и призыв: «В области медицины. Узнайте первыми». Инвертированный порядок слов («прорыв совершили ученые» вместо нейтрального «ученые совершили прорыв») усиливает экспрессивность и драматизацию сообщения, а короткая парцеллированная вставка уточняет контекст, не перегружая читателя деталями. Финальный императивный элемент выполняет прагматическую функцию побуждения к действию, усиливая вовлеченность.

Для сопоставления показателей *контрольный пример*, иллюстрирующий нейтральный синтаксис. Типичный пост со

страницы IT-компания сообщает информацию развернуто и информативно, как правило, в форме длинного сложного предложения: «ВКонтакте представила *“Итоги года 2025”*: в специальном мини-приложении можно узнать, как прошел год в соцсети и получить предсказание на 2026 год...». или «III – мощный инструмент, но не волшебная палочка. Раньше, чтобы узнать структуру белка, нужно было потратить год работы и кучу денег, а сейчас AI делает это за минуты». Здесь отсутствуют риторические вопросы, парцелляция, инверсия, нет визуального ряда; сообщение ориентировано на полноту и точность, но лишено экспрессивных средств, обеспечивающих мгновенное вовлечение. Подобная синтаксическая организация типична для менее виральных публикаций и коррелирует с более низкими показателями пользовательской реакции.

На основании совокупности количественных и качественных данных можно выделить несколько устойчивых синтаксических паттернов виральности, повторяющихся в различных тематических сегментах. Во-первых, это паттерн «вопрос – ответ – решение», при котором текст начинается с риторического вопроса, за которым следует краткий ответ и прагматически ориентированное предложение решения (например: «Нет времени на учебу? Есть решение. Всего 10 минут в день.»). Во-вторых, паттерн «инверсия + акцент», где ключевое слово или результат выносится в начальную позицию и затем уточняется короткими сегментами («Прорыв совершили ученые. В области медицины. Узнайте первыми.»). В-третьих, паттерн «декомпозиция сообщения», реализующийся в серии кратких парцеллированных высказываний, последовательно раскрывающих тезис («Технология изменит все. Скорость выше. Цена ниже. Это гениально.»). Во всех случаях наблюдается выраженная ритмизация текста и минимизация синтаксической развернутости.

Обобщая результаты, можно констатировать, что синтаксическая редукция выступает ключевым маркером виральности: виральный контент в среднем на 39% короче контрольного (8.7 против 14.3 слова в предложении), а экспрессивные конструкции используются статистически значимо чаще (риторические вопросы — в 2.9 раза, парцелляция — в 3.9 раза, инверсия — в 2.2 раза). Сильная отрицательная корреляция длины предложения с вовлеченностью ($r = -0.68$) подтверждает гипотезу об алгоритмическом предпочтении лаконичных и динамичных форматов.

Тем самым выявленные синтаксические паттерны можно рассматривать как ядро алгоритмического идиолекта. На морфосинтаксическом уровне алгоритмическая адаптация проявляется как систематическое упрощение и ритмизация текста, при которых синтаксическая сложность уступает место скорости восприятия, акцентности и прагматической эффективности коммуникации.

2) Лексико-семантический анализ вирального контента

На данном уровне анализ был направлен на выявление тех смысловых и оценочных элементов, которые статистически ассоциируются с высоким коэффициентом вовлеченности аудитории. Для проверки гипотезы исследования был проведен частотный анализ лексики виральной и контрольной групп, анализ тональности сообщений и выявление типичных семантических паттернов.

В первую очередь был выполнен частотный анализ лексем, статистически значимо различающихся между виральной и контрольной группами. Сравнение проводилось с использованием критерия χ^2 (хи-квадрат) и расчета отношения шансов (Odds Ratio), что позволило выявить слова-маркеры, повышающие вероятность алгоритмического масштабирования контента.

Таблица 3. Частотность ключевых лексем в виральной и контрольной группах
Table 3. Frequency of Key Lexemes in Viral and Control Groups

Слово/Фраза	Виральная группа	Контрольная группа	Отношение шансов	p-value
простой	4.2%	1.1%	3.82	< 0.001
секрет	3.8%	0.9%	4.22	< 0.001
гениальный	2.9%	0.6%	4.83	< 0.001
шок	2.7%	0.5%	5.40	< 0.001
революционный	2.5%	0.7%	3.57	< 0.001
сенсация	2.3%	0.4%	5.75	< 0.001
бесплатно	4.8%	2.1%	2.29	< 0.01
способ	3.9%	1.8%	2.17	< 0.01

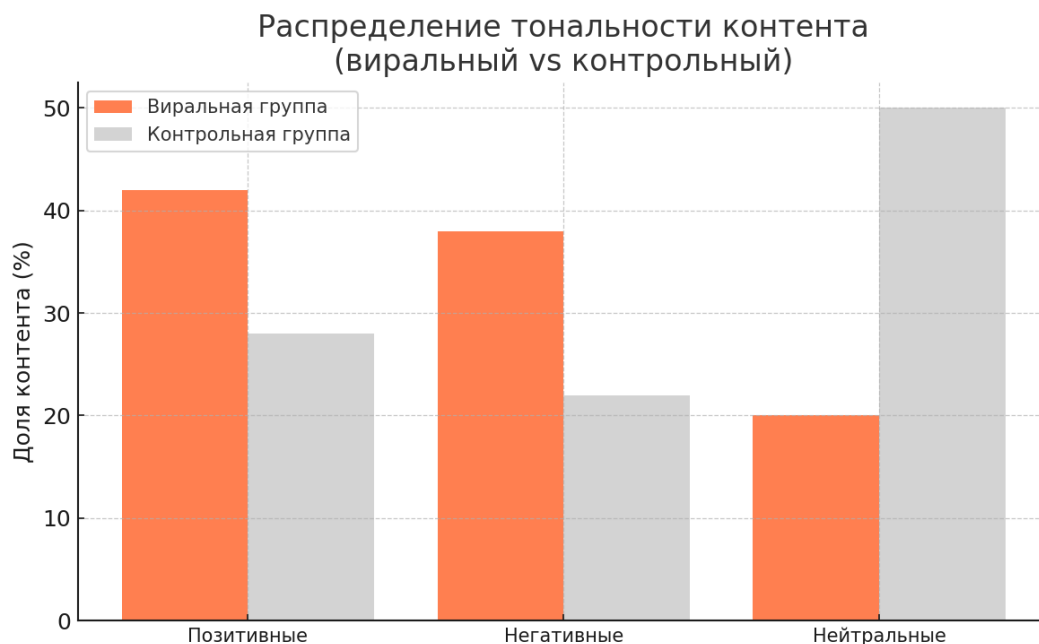
Как видно из таблицы, виральный контент характеризуется существенно более высокой частотностью лексем, объединяемых общей семантикой упрощения, эксклюзивности и эмоционального воздействия. Особенно выражены различия по словам *шок*, *сенсация*, *гениальный*, *секрет*, где отношение шансов превышает 4–5, что указывает на сильную связь этих лексем с виральным распространением. Семантически данные слова формируют у адресата ощущение особой ценности и исключительности информации («*секрет*», «*сенсация*»), а также обещание когнитивной экономии («*простой способ*», «*бесплатно*»). Подобные лексические маркеры не столько передают информацию, сколько выполняют прагматическую функцию привлечения

внимания и мотивации к дальнейшему взаимодействию с контентом. Так, например распространены заголовки в духе: «*Шок! То, что случилось с этим человеком, изменит ваше представление о жизни навсегда!*», где напрямую используется слово «шок» и обещается сенсация. В технологической сфере можно встретить заголовки вроде «*Эти 9 секретных промптов превращают GPT в гения-маркетолога! Просто скопируй!*».

Дополнительно был проведен анализ общей тональности сообщений с целью выявления различий в эмоциональной насыщенности между группами. Для каждого поста определялась доминирующая тональность (позитивная, негативная, нейтральная) и интегральный показатель эмоциональной интенсивности.

Рисунок 6. Распределение тональности в контенте (доли позитивных, негативных и нейтральных сообщений) для виральной и контрольной групп

Figure 6. Sentiment Distribution in Content (Proportions of Positive, Negative, and Neutral Messages) in Viral and Control Groups



Полученные данные показывают, что виральный контент принципиально отличается от контрольного по уровню эмоциональной экспрессии. Вирусные публикации значительно реже имеют нейтральную тональность (20% против 50%) и, напротив, характеризуются доминированием эмоционально окрашенных сообщений. Позитивные эмоции вообще несколько преобладают над негативными в вирусном контенте (42% против 38%). Однако вирусный эффект дают и отрицательные эмоции, если они сопряжены с элементом сюрприза или возмущения. Более того, ряд данных свидетельствует, что негативные триггеры (страх, гнев, тревога) могут генерировать даже больше кликов, чем позитивные новости (Libert, 2024)¹.

Средний показатель эмоциональной интенсивности в виральной группе почти вдвое выше, чем в контрольной (0.72 против 0.41), что подтверждает гипотезу о том, что алгоритмически успешный контент должен вызывать сильный аффективный отклик. Нейтральное, описательное изложение, напротив, значительно реже становится объектом алгоритмического усиления.

Отдельное внимание было уделено анализу бинарных оппозиций – конструкций, основанных на противопоставлении двух состояний, оценок или сценариев. Для их выявления применялся шаблонный N-граммный анализ.

¹ <https://martech.org/what-makes-content-go-viral-backed-by-research/#:~:text=,common%20emotion%20in%20viral%20content>

Таблица 4. Основные бинарные оппозиции в виральном контенте
Table 4. Key Binary Oppositions in Viral Content

Оппозиция	Примеры из виральной группы	Частота
просто/сложно	Раньше это было сложно, теперь – просто	12.3%
до/после	Результат ДО и ПОСЛЕ использования"	9.8%
старое/новое	Старая технология vs. Новый подход"	8.1%
правильно/неправильно	95% делают это неправильно	7.4%
дорого/бесплатно	Платите тысячи или получайте бесплатно	6.9%

Как видно, вирусный контент нередко преподносит информацию через резкие противопоставления: “было трудно – стало легко”, “до – после”, “старое – новое”, “правильно – неправильно”, “дорого – бесплатно” и т.д. Подобная поляризация сообщений выполняет сразу несколько задач. Во-первых, она упрощает сложную идею до понятной дуальной схемы, которую легче воспринять и запомнить. Во-вторых, драматизм контраста привлекает внимание – читателю интересно увидеть “прорыв” или “разоблачение”, когда что-то плохое сменяется на хорошее, дорогое противопоставляется бесплатному, сложное упрощается и т.п. Фактически, бинарные оппозиции превращают посыл в мини-историю с конфликтом и разрешением, что повышает вовлеченность. Например, фраза «95% делают это неправильно» мгновенно

цепляет: аудитория узнает, что *почти все ошибаются*, и ее мотивируют узнать, *как же правильно*. Таким образом, противопоставления усиливают эффект новизны и значимости предлагаемых сведений, побуждая пользователя заинтересоваться контентом.

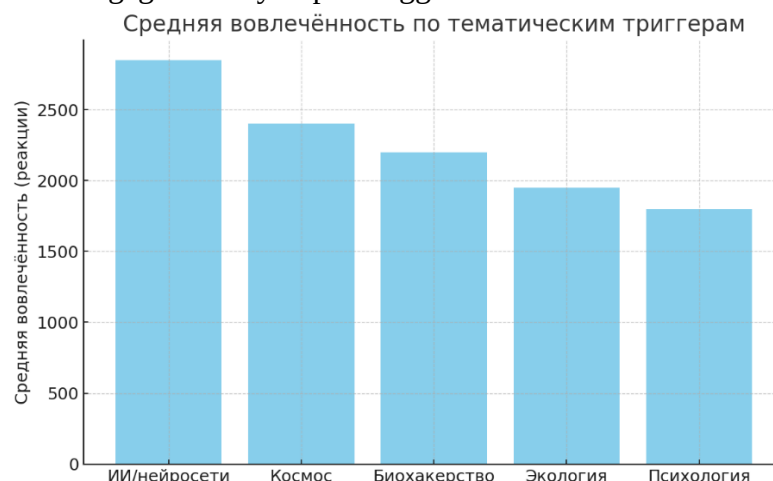
На следующем этапе были выделены тематические кластеры, внутри которых наблюдается повышенный уровень вовлеченности. Для этого была сопоставлена средняя вовлеченность постов с доминирующей тематикой. Анализ тематических кластеров показал, что у вирусного контента часто наблюдаются определенные “триггерные” темы, вокруг которых сосредоточено повышенное внимание аудитории. В нашем случае можно выделить топ-5 наиболее виральных тематик (по средней вовлеченности поста, в реакции):

Таблица 5. Тематические триггеры вирального контента
Table 5. Thematic Triggers of Viral Content

Тема	Ключевые слова-триггеры	Средняя вовлеченность
ИИ/нейросети	нейросеть, ChatGPT, генеративный ИИ, AI, Midjourney	2850 реакций

Тема	Ключевые слова-триггеры	Средняя вовлеченность
Экология	устойчивый, эко-френдли, углеродная нейтральность, углеродный след	1950 реакций
Биохакерство	Долголетие, биохакинг, оптимизация, здоровье 2.0	2200 реакций
Космос	Илон Маск, SpaceX, космические технологии, Марс	2400 реакций
Психология	ментальное здоровье, прокрастинация, дофамин, осознанность	1800 реакций

Рисунок 7. Средняя вовлеченность контента в зависимости от тематики/триггера
Figure 7. Average Content Engagement by Topic/Trigger



Примечательно, что все эти триггер-темы так или иначе апеллируют к сильным эмоциям и актуальным интересам общества. **Популярные тренды** (бурный прогресс ИИ, космические достижения) вызывают восторг и чувство причастности к будущему, тогда как социально значимые темы (экология, психическое здоровье) затрагивают чувство ответственности или личной обеспокоенности. Кроме того, многие из перечисленных триггеров сопровождались характерными «виральными» словами. Например, материалы по ИИ часто содержали в заголовках слова вроде «прорыв», «революционный ИИ», «потрясающий пример», посты про космос

– «марсианская колония», «исторический запуск» и т.д., что усиленно стимулирует интерес аудитории. В целом же выбор темы сам по себе влияет на шансы контента стать вирусным: способность затронуть **модный тренд или животрепещущую проблему** – важнейший фактор виральности². Как отмечают специалисты, вирусный контент обычно либо касается того, что уже «на слуху» у масс, либо преподносит

² <https://news.pressfeed.ru/virusnyj-marketing-chto-eto-takoe-kak-im-zanimatsya-primery-uspeshnyh-kampanij/#:~:text=Основной%20параметр%20вирусного%20маркетинга%20–,истории%2C%20а%20также%20забавный%20контент>

неожиданный новый факт по знакомой теме, либо дает практически полезные советы по популярному запросу (там же). Наш анализ триггерных тематик подтверждает это: наибольший отклик получают либо трендовые технологические темы, либо универсально значимые вопросы (здоровье, психология, экология), особенно если поданы с эмоцией и новизной.

3) Дискурсивно-прагматический анализ вирального контента

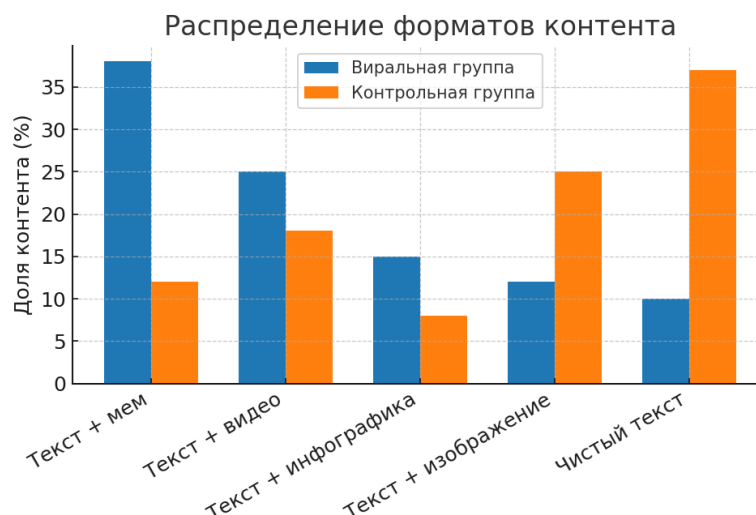
На дискурсивно-прагматическом уровне анализ был направлен на выявление способов организации сообщения как целостного коммуникативного акта в условиях алгоритмически управляемой медиасреды. В рамках исследования предполагалось, что виральный контент отличается не только формальными языковыми и

лексико-семантическими характеристиками, но и специфической прагматической архитектурой, включающей мультимодальность, стратегическое использование визуальных элементов, мемов и хэштегов, а также ориентацию на алгоритмическую видимость.

Сравнительный анализ форматов публикаций показал резкое расхождение между виральной и контрольной группами по степени поликодовости. В виральной выборке лишь около 10% сообщений представляли собой чисто текстовые посты, тогда как остальные ~90% включали визуальные компоненты: мемы, видео, инфографику или статические изображения. Для сопоставления, в контрольной группе доля чисто текстовых публикаций достигала 37%, а мультимодальные форматы использовались существенно реже.

Рисунок 8. Распределение форматов контента

Figure 8. Distribution of Content Formats



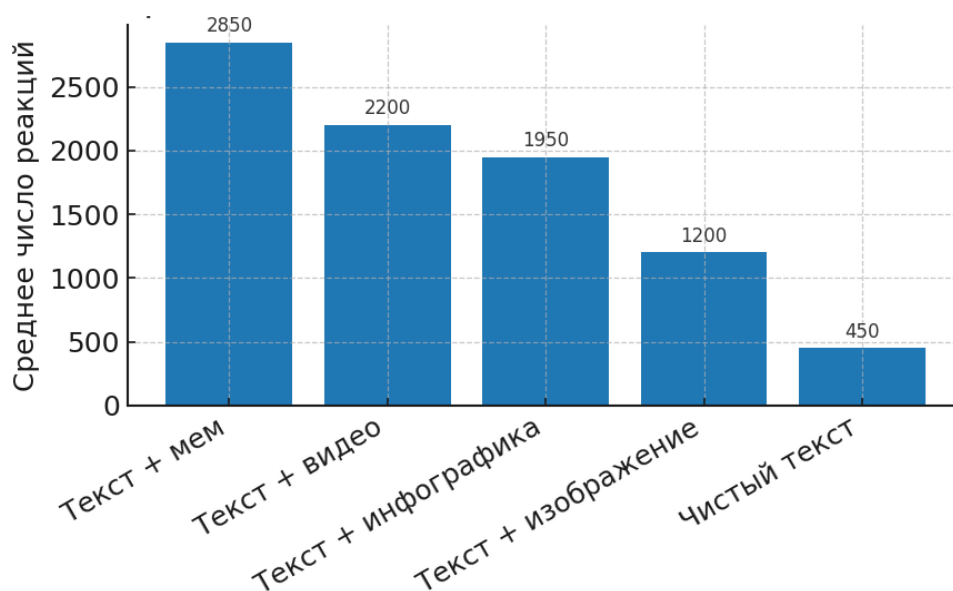
Анализ метрик вовлеченности подтверждает эффективность поликодовых форматов: чисто текстовые публикации собирали в среднем лишь около 450 реакций, тогда как любой добавленный визуальный элемент заметно повышал отклик аудитории. Так, посты с изображениями получали ~1200 реакций, с инфографикой – около 1950, с видео – порядка 2200. Максимальный эффект

наблюдается у постов, сопровождаемых мемами: в среднем ~2850 реакций, что более чем в 6 раз превосходит показатели текста без дополнений. Мем можно определить как «краткий фрагмент медийного текста, сочетающий информационное содержание с яркой упаковкой и благодаря этому многократно копируемый в культуре заинтересованной

аудитории³. Мемы анализируют как мультимодальные дискурсивные объекты, сочетающие текст и изображение, построенные «горьким юмором» и лаконичностью, направленные на мобилизацию и распространение политических нарративов в ультраправых сообществах (Накокӧнгӧс et al., 2020). Популярность мемов как социального феномена подтверждается тем, что около 30% миллениалов и представителей

поколения Z обмениваются мемами ежедневно. Следовательно, интеграция мема в пост существенно повышает шансы на вирусное распространение, делая сообщение более «заразительным» за счет эмоциональной вовлеченности. В целом прослеживается прямая зависимость: чем более мультимодален контент, тем выше у него показатели вовлеченности. Это наглядно иллюстрирует следующая схема:

Рисунок 9. Средняя вовлеченность по типу контента
Figure 9. Average Engagement by Content Type



Корреляционный анализ подтвердил значимость рассмотренных дискурсивно-прагматических факторов. Наличие мема в посте оказалось сильнейшим предиктором виральности (коэффициент корреляции $r = 0.68$, $p < 0.001$). Также высокую положительную связь с количеством реакций показало использование оценочных хэштегов – $r = 0.57$ ($p < 0.001$). Вклад таких параметров, как общее количество хэштегов ($r = 0.42$, $p < 0.01$) и формат

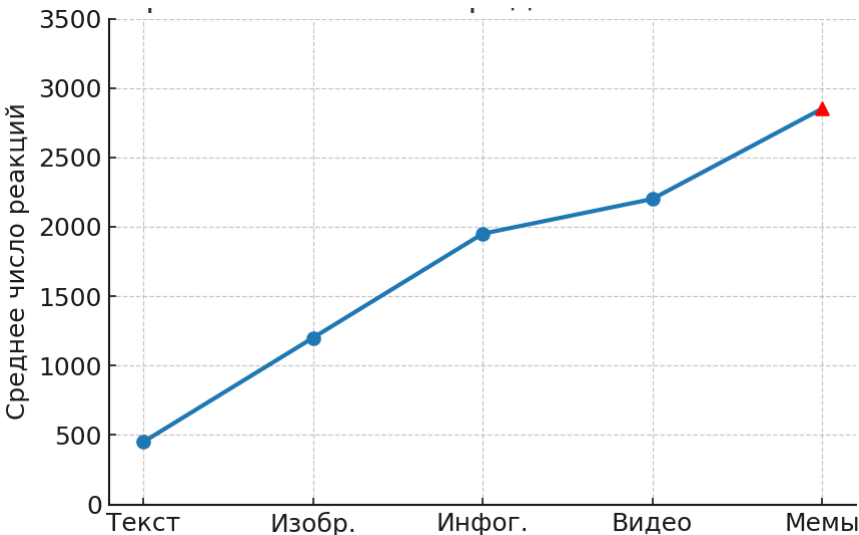
«текст + видео» ($r = 0.39$, $p < 0.01$), статистически значимо меньший, но тоже существенный. Таким образом, данные свидетельствуют: юмористический мем-контент и экспрессивные хэштеги сильнее всего «разгоняют» вовлеченность, тогда как просто добавление видео или множества тегов дает умеренный эффект. График (рис. 10) визуализирует общий тренд: переход от текста к изображениям, инфографике, видео и мемам сопровождается неуклонным ростом средней реакции аудитории.

³ https://russiancouncil.ru/analytics-and-comments/analytics/politicheskie-memy-i-novyy-mirovoy-poryadok/?sphrase_id=104258383#:~:text=Мем%20,1

Этот положительный градиент подтверждает, что мультимедийное обогащение контента является ключевым фактором его вирусного успеха. Более того, определенные типы визуального контента сами по себе привлекательны для пользователей – например, ~90%

читателей считают полезными наглядные инфографики, а мемы прочно вошли в повседневную коммуникацию в соцсетях. Все это создает благодатную почву для повышенного распространения подобных сообщений.

Рисунок 10. Связь формата контента и средней вовлеченности
Figure 10. Relationship Between Content Format and Average Engagement



Виральные посты часто опираются на мемы как на особый формат, совмещающий изображение и текст в юмористической или метафорической

форме. Был проведен контент-анализ мемов с точки зрения их прагматических функций, и выявлено несколько основных категорий:

Таблица 6. Основные категории мемов
Table 6. Main Categories of Memes

Функция	Доля мемов	Ср. вовлеченность	Пример контента
Юмористическая (развлечение, шутка)	45%	3200	«Когда пытаешься объяснить ИИ» + картинка с котиком (ирония непонимания)
Объясняющая (упрощенное разъяснение)	25%	2400	Инфографика «Как работают нейросети» в формате мем-шутки
Провокационная (эпатаж, спор)	20%	3800	«Ваше мнение устарело» + заведомо спорное утверждение для споров
Мобилизующая (призыв к действию)	10%	1800	«Присоединяйся к движению!» + мотивационный слоган и хештег акции

Юмористические мемы доминируют количественно и обеспечивают высокий, но не максимальный уровень вовлеченности. Наибольший эффект демонстрируют провокационные мемы, стимулирующие дискуссию и поляризацию аудитории. Мобилизующие мемы, напротив, оказываются наименее эффективными, что позволяет предположить: открытая агитация уступает виральности юмору и конфликту.

Хэштеги (слова или фразы, помеченные символом #) зародились как механизм навигации в соцсетях, как

способ группировать сообщения по темам для удобного поиска. Еще недавно хэштег был прежде всего инструментом объединения постов на одну тему, но сегодня его функция существенно расширилась (Латушко, 2022: 58). Хэштеги в социальных медиа выполняют важную прагматическую функцию маркировки контента и влияния на его алгоритмическую видимость. Наш анализ показал, что создатели вирального контента используют хэштеги значительно активнее, чем обычные пользователи:

Таблица 7. Сравнительные показатели использования хэштегов
Table 7. Comparative Indicators of Hashtag Usage

Параметр	Виральная группа	Контрольная группа
Среднее количество хэштегов на пост	3.8	1.2
Посты без хэштегов	5%	42%
Оценочные (эмоционально-окрашенные) хэштеги	25%	8%

В виральных постах в среднем используется 3–4 хэштега, тогда как в контрольной выборке лишь 1–2. Почти каждый вирусный пост снабжен хотя бы одним хэштегом (только 5% обошлись без них), в то время как среди неvirальных постов *более 40%* вообще не содержали тегов. Также заметно, что авторы вирусного контента чаще добавляют оценочные хэштеги – эмоциональные маркеры типа #шок, #гениально – четверть популярных постов содержала подобные теги, тогда как в обычной группе лишь 8%. Эти различия отражают продуманную стратегию: хэштеги делают пост доступным для более широкой аудитории, так как привязывают его к популярным темам и обсуждениям. Кроме того, хэштеги способствуют вовлечению – исследования показывают, что публикации

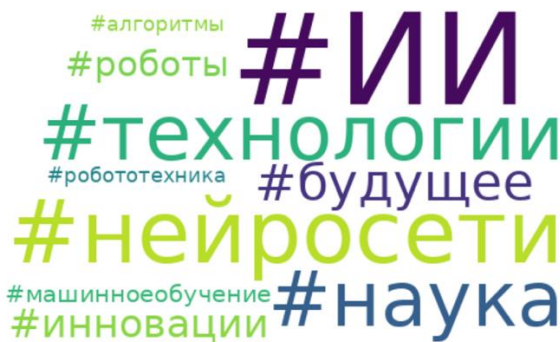
с хэштегами получают ~12% больше откликов пользователей. Оптимальным считается использование нескольких релевантных тегов; рекомендации на 2025 год говорят о 3–5 хэштегах как «золотой середине» (избыток тегов может восприниматься как спам). Именно такое число мы и видим в среднем у вирусных постов. Таким образом, авторы вирусного контента сознательно насыщают сообщения тегами для максимального охвата, тогда как менее успешные авторы нередко игнорируют этот инструмент

Частотный анализ тегов выявил преобладание тематических хэштегов, отражающих ключевые темы контента. Как видно из облака тегов, в топ-10 вошли прежде всего слова, связанные с технологиями и наукой: #ИИ, #нейросети, #технологии, #наука, #будущее,

#инновации и др. Это показывает, что вирусный контент активно помечается по теме (например, посты про искусственный интеллект получают теги #ИИ и #нейросети почти по умолчанию). Такие теги выполняют сразу две функции: во-первых, повышают алгоритмическую видимость поста в соответствующих интересах аудитории, во-вторых, формируют для читателя *фрейм восприятия*, заранее указывая, о чем будет сообщение (наука, инновации, и т.д.).

Менее часто в топ-10 встречаются эмоционально окрашенные теги типа #шок или #гениально. Они используются точно для создания эффекта сенсационности, но не принадлежат к одной тематике, поэтому по отдельности не превосходят по частоте тематические метки. Тем не менее, роль таких оценочных хэштегов проявляется в другом измерении – в уровне вовлеченности, который они генерируют.

Рисунок 11. Облако топ-10 хэштегов в виральном контенте
Figure 11. Word Cloud of the Top 10 Hashtags in Viral Content



Функциональная классификация хэштегов в виральном контенте показала, что помимо тематики, теги выполняют ряд прагматических ролей:

Таблица 8. Классификация хэштегов по прагматическим функциям
Table 8. Classification of Hashtags by Pragmatic Functions

Функция	Доля	Средняя вовлеченность	Примеры
Тематические	55%	2100	#ИИ, #наука, #технологии
Оценочные	25%	3500	#гениально, #шок, #революционно
Призывные	15%	2800	#узнайпервым, #попробуй, #делись
Идентификационные	5%	1900	#нашакоманда, #сообщество

Можно сделать вывод, что успешный виральный пост стремится комбинировать несколько видов хэштегов: как минимум один-два по теме и при необходимости – один оценочный для усиления эмоционального отклика.

Помимо количественных параметров, исследование выявило типичные дискурсивные паттерны, присущие вирусной коммуникации. Эти паттерны показывают, как авторы контента комбинируют различные средства языка и визуального ряда, ориентируясь на восприятие аудитории и алгоритмов платформ:

Мультимодальная аргументация. Виральный дискурс отличается преобладанием *визуально-текстового повествования*, где основная смысловая нагрузка возлагается на изображение или клип, а текст играет вспомогательную роль. Такой прием можно назвать аргументацией через мем или инфографику: вместо длинного объяснения автор подбирает меткое изображение (мем, график, диаграмму) и сопровождает его минимальным комментарием. В результате сложная идея коммуницируется быстро и эффективно, пользуясь когнитивными преимуществами визуализации. Подобная мультимодальность не только удерживает внимание скроллящей аудитории, но и облегчает **доступность информации** – не даром 90% пользователей считают, что инфографика помогает им лучше усвоить материал. Таким образом, сочетание картинки и краткого текста создает убедительный месседж, легко распространяемый и понимаемый в социальных сетях.

Хэштег-фрейминг. Еще одной характерной чертой вирусного дискурса является активное использование хэштегов для *рамки смыслов* и привлечения трафика. Создатели виральных сообщений нередко включают в пост **несколько тематических хэштегов**, сразу определяя контекст (например, *#нейросети*, *#инновации для технологических новостей*). Помимо темы, добавляются **оценочные теги**, которые задают эмоциональный тон (скажем, *#шок*, *#сенсация* или *#вау* могут предварительно настроить читателя на удивление). В результате еще до чтения основного текста

аудитория получает от хэштегов имплицитный сигнал, *как воспринимать контент* – как что-то удивительное, забавное, важное или относящееся к конкретной сфере. Одновременно хэштеги выполняют и сугубо прагматическую роль – благодаря им пост попадает в соответствующие фиды и поисковые выборки, что существенно увеличивает шансы на вирусное распространение контента за пределы изначальной аудитории.

Алгоритмическая оптимизация контента. Полученные результаты свидетельствуют, что авторы вирусного контента сознательно подстраивают форму подачи под алгоритмические требования платформ. Выявлен

своеобразный *алгоритмический дизайн* сообщений: комбинируются те элементы (мемы, видео, теги, упоминания), которые, как известно, повышают показатели охвата и вовлеченности. Например, если платформа продвигает видеопосты, то делается упор на короткий клип; если в тренде определенный мем-шаблон, используют именно его; если алгоритмы учитывают активность обсуждений, автор может сформулировать провокационный вопрос для комментариев. Такие

метадискурсивные стратегии вырабатываются на основе опыта и инсайтов о работе алгоритмов. В результате контент получается *«оптимизирован под продвижение»*. Можно сказать, формируется особый регистр речи – гибрид человеческого творчества и расчета под машину. Как отмечается в современных медиаисследованиях, знание о том, какой формат и какие ключевые слова предпочитают алгоритмы, заставляет создателей контента изначально конструировать сообщение в наиболее выгодном виде. Иными словами, виральный дискурс – это адаптивный дискурс: стиль, тон, структура поста планируются с оглядкой не только на

людей, но и на алгоритмического «читателя».

Полученные результаты свидетельствуют о формировании специфического дискурсивного регистра, ориентированного на алгоритмическое

продвижение через оптимизацию поликодовых параметров контента.

Заключение

На основе проведенного исследования нами была разработана базовая типология виральных паттернов, представленная в Таблице 9.

Таблица 9. Классификация механизмов виральности
Table 9. Classification of Virality Mechanisms

Тип виральности	Драйвер распространения	Примеры
Эмоциональная	Аффективный резонанс	Мемы, трогательные истории
Прагматическая	Утилитарная ценность	Лайфхаки, инструкции
Социальная	Идентификационный маркер	Флешмобы, челленджи
Алгоритмическая	Платформенное усиление	Контент, оптимизированный под рекомендательные системы

Проведенный многоуровневый лингвистический анализ подтвердил исходную гипотезу о том, что в условиях алгоритмически управляемой медиасреды виральность контента является результатом системной адаптации языковых и дискурсивных стратегий к критериям платформенного отбора. На всех трех исследовательских уровнях – морфосинтаксическом, лексико-семантическом и дискурсивно-прагматическом – зафиксированы статистически значимые различия между виральным и контрольным контентом. Ниже обобщены ключевые выводы:

На морфосинтаксическом уровне установлена тенденция к синтаксической редукции. Средняя длина предложения в вирусных текстах существенно меньше (≈8.7 слов против 14.3 в контроле) за счет разбиения мысли на короткие фразы. Активно используются риторические вопросы (в 3 раза чаще, чем в контроле),

парцелляция (в ~4 раза чаще) и инверсия (в ~2 раза чаще), формируя у текста ритмичность и экспрессивность. Выявлены устойчивые синтаксические паттерны (“вопрос–ответ–решение”, “инверсия+акцент”, “серия парцеллятов”), составляющие ядро алгоритмически оптимизированного стиля на структурном уровне.

На лексико-семантическом уровне подтверждена гипертрофия эмоциональности. Виральные тексты демонстрируют доминирование экспрессивной лексики (“шок”, “сенсация”, “гениально” и пр.), служащей для привлечения внимания. Около 45% вирусных постов построены на бинарных оппозициях (против ~20% в контроле), упрощая и драматизируя смысл. Топ-темы вирусного контента отражают текущую повестку: многочисленные упоминания технологий (ИИ, нейросети) и других трендовых концептов выступают

семантическими триггерами, повышающими заметность и актуальность сообщений.

На дискурсивно-прагматическом уровне выявлена доминанта поликодовости. Почти 90% вирусных постов используют гибридные форматы (изображения, мемы, видео и т.д.), тогда как чисто текстовые сообщения крайне редко достигают высокой вовлеченности. Наибольший эффект дают мемы и наглядные инфографики, значительно повышающие отклик аудитории. Практически обязательным элементом вирусного поста стал хэштег: в среднем ~3–4 тега на пост (против ~1 в контроле), выполняющие одновременно навигационную и прагматико-оценочную функцию. Хэштеги задают контекст и эмоцию высказывания, а также увеличивают шансы на попадание контента в тренды и рекомендательные ленты.

В совокупности результаты исследования указывают на формирование своеобразного алгоритмического идиолекта в цифровом дискурсе – стандартизированного языка и стиля, выработанного под воздействием алгоритмических фильтров платформ. Этот идиолект характеризуется краткостью, эмоциональностью, клишированностью и мультимодальностью, то есть всеми теми чертами, которые повышают показатели вовлеченности и видимости. По сути, эффективность сообщения определяется не столько его содержательной новизной или глубиной, сколько соответствием формальным параметрам, считаемым «привлекательными» для алгоритма (и как следствие – для массовой аудитории). Данное явление отмечено не только в развлекательном или коммерческом сегменте, но и в политической коммуникации – там также наблюдается унификация и упрощение языка под влиянием алгоритмической логики. Это свидетельствует о универсальном

характере алгоритмического детерминизма в сфере публичной речи: дискурсы различной природы вынужденно приобретают общие черты, продиктованные метриками онлайн-платформ.

Разработанная методика анализа позволяет: прогнозировать виральный потенциал контента на основе лингвистических маркеров; оптимизировать коммуникационные стратегии для цифровой среды; разрабатывать образовательные программы по цифровой грамотности.

Таким образом, формирование алгоритмического идиолекта свидетельствует не просто об изменении стиля, а о более глубокой трансформации механизмов языковой эволюции в цифровой среде. Эволюционный отбор языковых форм все в большей степени осуществляется не в рамках естественной коммуникации между людьми, а под воздействием искусственной среды платформенных алгоритмов, отбирающих контент по формальным, квантифицируемым параметрам. Это порождает феномен «двойной адресации», где языковая стратегия становится инструментом интерфейса с машинной логикой. Подобная оптимизация ведет к стандартизации и ритуализации цифрового дискурса, что, в перспективе, может влиять на когнитивные паттерны восприятия информации, способствуя фрагментации и эмоциональной поляризации. Следовательно, алгоритмический идиолект следует рассматривать как ключевой маркер новой парадигмы публичной коммуникации, в которой эффективность речи детерминируется ее совместимостью с инфраструктурой внимания.

Перспективным представляется кросс-платформенное сравнительное исследование, которое позволит выявить локальные варианты алгоритмического идиолекта. Методологически оно может быть построено на сопоставлении корпусов контента единой тематики с

платформ, различающихся архитектурой (например, VK, Telegram, TikTok), с применением единого набора лингвистических метрик. Для изучения долгосрочных эффектов целесообразно комбинировать лонгитюдный корпусный анализ (отслеживание динамики паттернов) с экспериментальными методами (А/В-тестирование воздействия разных стилей на восприятие) и качественными интервью с продуцентами контента. Наконец, сравнительный анализ различных дискурсивных сфер (политического, научного, коммерческого) с использованием разработанной в данной работе трехступенчатой модели позволит оценить универсальность давления алгоритмической логики на публичную речь.

В заключение можно констатировать, что алгоритмически опосредованная коммуникация порождает новую риторическую парадигму, где эффективность высказывания определяется не столько его содержательной ценностью, сколько соответствием формальным параметрам платформенных алгоритмов. Это требует пересмотра традиционных лингвистических моделей в контексте цифровой трансформации публичной сферы и медиакommunikации.

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Наталья Александровна Ахренова, доктор филологических наук, доцент, руководитель отделения постдипломного образования института иностранных языков РУДН, профессор кафедры теории и практики иностранных языков, ведущий научный сотрудник института иностранных языков Российского университета дружбы народов имени Патриса Лумумбы, Москва, Россия.

Владимир Алексеевич Сербин, кандидат филологических наук, доцент Военного учебного центра, Московский государственный лингвистический университет, докторант «Военного университета имени князя Александра Невского» Министерства обороны Российской Федерации, Москва, Россия.

Natalia A. Akhrenova, Doctor of Philology, Associate Professor, Head of the Department of Postgraduate Education, Institute of Foreign Languages, RUDN University, Professor of the Department of Theory and Practice of Foreign Languages, Leading Researcher at the Institute of Foreign Languages, RUDN University, Moscow, Russia.

Vladimir A. Serbin, PhD in Philology, Associate Professor of the Military Training Center, Moscow State Linguistic University, Doctoral Student at the “Prince Alexander Nevsky Military University” of the Ministry of Defense of the Russian Federation, Moscow, Russia.

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Герасимова А. А.¹

**Грамматическое изменение в лабораторных условиях:
может ли частота предъявления стимула в эксперименте
сместить суждения о приемлемости?**

¹ ФГБОУ ВО «Московский государственный университет имени М.В. Ломоносова»
Ленинские горы, 1, Москва, 119991, Россия
E-mail: anastasiagerasimova432@gmail.com
ORCID: 0000-0003-4686-5598

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Аннотация: Статья посвящена экспериментальной проверке гипотезы о роли статистического научения в грамматических изменениях. Грамматические изменения связывают с тем, что носители адаптируют свое языковое поведение к переменному языковому сигналу. Ключевое значение для языковой адаптации имеет статистическое научение — способность выявлять закономерности на основе частотных характеристик языковых данных. При том, что эта идея стала общим местом для лингвистов из разных направлений, до сих пор не было изучено, как именно изменение статистического распределения конструкции во входном сигнале влияет на грамматические интуиции носителей языка. В статье представлен эксперимент, моделирующий ситуацию грамматического изменения в условиях внутриязыковой вариативности. На материале вариативного согласования с сочиненным подлежащим в русском языке проверялось, влияют ли различия в соотношении частоты предъявления конкурирующих грамматических вариантов на оценки приемлемости. Рассматривалось лично-числовое согласование с сочиненным подлежащим, включающим местоименный и именной конъюнкты. Было проведено два параллельных эксперимента для двух пар согласовательных стратегий. Пары стратегий были выбраны на основе экспериментальных данных из литературы: варианты в парах не отличаются по приемлемости, причем первая пара занимает верхнюю область шкалы приемлемости, а вторая — срединную. Дизайн экспериментов был межгрупповой, экспериментальная переменная частоты предъявления варианта имела пять уровней. Ожидание состояло в том, что при изменении соотношения вариантов возможно, с одной стороны, смещение абсолютных оценок, а с другой — появление статистически значимого различия между двумя вариантами. Результаты эксперимента оказались неоднозначными: хотя эффект смещения оценок был обнаружен, его аномальный и несистематический характер не позволяет исключить его интерпретацию как методологического артефакта. При этом выявлен другой значимый эффект — зависимость грамматических суждений от уровня приемлемости сопутствующего языкового материала.

Ключевые слова: Грамматическое изменение; Суждения о приемлемости; Статистическое научение; Вариативное согласование; Русский язык

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Anastasia A. Gerasimova¹ 

Inducing grammar change: can input frequency modify acceptability judgments in an experiment?

¹ Lomonosov Moscow State University,
GSP-1, Leninskie Gory, Moscow, 119991, Russia
E-mail: anastasiagerasimova432@gmail.com
ORCID: 0000-0003-4686-5598

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Abstract: This study experimentally investigates the role of statistical learning in grammatical change. We test the hypothesis that speakers adapt their grammatical intuitions by tracking distributional frequencies in variable linguistic input. Although statistical learning is widely acknowledged as a key mechanism in language adaptation, the precise impact of changing input distributions on acceptability judgments remains unclear. To address this, we designed an experiment simulating grammatical change within intra-lingual variation. The study examines variable person-number agreement with conjoined subjects in Russian, focusing on structures containing both pronominal and nominal conjuncts. The core question we are investigating is whether manipulating the frequency ratio of competing grammatical variants in the input affects speakers' judgements of acceptability. We conducted two parallel experiments, each focusing on a distinct pair of agreement strategies. These pairs were chosen based on prior experimental work; within each pair, the two variants were matched in acceptability, with one pair occupying the high end and the other the middle range of the acceptability scale. Using a between-subjects design, we manipulated the presentation frequency of each variant across five levels. We hypothesized that exposure to different frequency ratios would not only shift the absolute acceptability of variants but also induce a significant difference between them. The results, however, were inconclusive. Although we observed a shift in ratings, the effect was anomalous and non-systematic, preventing us from interpreting it as evidence for statistical learning; it may instead reflect a methodological artifact. However, we identified a robust link between acceptability judgments and the well-formedness of the co-occurring linguistic material.

Keywords: Grammatical change; Acceptability judgments; Statistical learning; Agreement variation; Russian

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1. Введение

Основная причина грамматических изменений — адаптация носителей к переменному языковому сигналу. Изменение статистических характеристик языковых данных, которые воспринимает человек (напр., частотность, корреляция между элементами), приводит к закреплению в языке одних форм и конструкций и к исчезновению других (Díaz-Campos, Balasch, 2023; Coussé, Mengden, 2014). Определяющим в этой связи становится статистическое научение — когнитивный механизм, позволяющий человеку выявлять закономерности и структуры в данных на основе их статистических свойств (Isbilen, Christiansen, 2022; Белова, Харлашина, 2015).

Исследование роли статистического научения в грамматических изменениях развивается преимущественно в двух направлениях. С одной стороны, статистические закономерности рассматриваются на материале корпусных данных в рамках подходов, основанных на употреблении (англ. *usage-based*; см., напр. (Bresnan, 2007; Reali, 2017; Bybee, 2023)). Однако лингвистические теории опираются не только на анализ реальных текстов, но и на оценку предложений носителями языка (Schütze, 1996, 2011; Featherston, 2007; Sprouse, Almeida, 2017). Суждения о приемлемости помогают понять, какие конструкции являются грамматически недопустимыми. Обращаясь к корпусу, невозможно получить такой языковой материал (называемый отрицательным). Таким образом, существующие исследования статистического научения обращаются лишь к одной составляющей языковой способности — порождению, оставляя без внимания понимание, репрезентируемое оценками.

С другой стороны, статистическое научение изучается в контексте усвоения языка, где основной фокус смещен на моделирование когнитивных способностей, связанных с усвоением грамматических правил и распознаванием языковых паттернов (см. напр., (Kidd, Arciuli, 2016; Gerbrand et al., 2022; Lavechin et al., 2022; Kidd et al., 2023)), а также обзор (Romberg, Saffran, 2010)). Данные исследования не занимаются прямой проверкой гипотез о том, как и почему грамматика меняется в языковом сообществе с течением времени.

Цель данной работы — преодолеть указанные ограничения. Мы проверим гипотезу о том, что под влиянием статистического научения в языке могут происходить грамматические изменения, которые проявляются в смещении оценок приемлемости. Существуют отдельные свидетельства в пользу такой возможности, в частности эффект пресыщения, когда многократное предъявление неграмматичной конструкции повышает ее воспринимаемую приемлемость (Snyder, 2000), или эффект якоря, при котором грамматичность стимулов, окружающих целевые предложения в эксперименте, может влиять на оценки приемлемости этих предложений (Nagata, 1992).

Моделировать ситуацию грамматического изменения мы будем на материале внутриязыковой вариативности. Наличие варьирования в языковой системе, когда один из языковых элементов может быть заменен другим без ущерба для коммуникации, — необходимое условие грамматического изменения (Бурлак, Старостин, 2005). В исследовании мы экспериментально проверим, как статистические характеристики конкурирующих вариантов влияют на соотношение их приемлемости. Конкретно будет исследовано, как изменения в соотношении частоты двух вариантов

конструкции в эксперименте могут влиять, с одной стороны, на абсолютные оценки приемлемости, а с другой — на появление статистически значимого различия между двумя вариантами.

В качестве материала исследования выбрано вариативное согласование с сочинительными конструкциями. Данный феномен подходит для целей эксперимента, поскольку для него существует обширная экспериментальная база, подтверждающая существование взаимозаменяемых вариантов согласования в определенных условиях.

Статья организована следующим образом. В разделе 2 мы обсудим эмпирические свидетельства эффектов смещения оценок приемлемости, а также методы, с помощью которых такие эффекты устанавливаются. Раздел 3 посвящен материалу исследования — согласовательной вариативности в контексте русских сочинительных конструкций. В разделе 4 описывается дизайн эксперимента, результаты и их статистический анализ. Раздел 5 представляет интерпретацию результатов. В разделе 6 приводятся выводы исследования.

2. Эффекты смещения оценок приемлемости

Оценки приемлемости представляют собой способ измерить интуитивное языковое чутье носителей языка, чтобы проверить лингвистическую гипотезу. ИмPLICITное деление предложений на правильные и неправильные используется лингвистами с появления первых грамматических описаний. Сейчас же этот прием имеет более точное воплощение в виде эксперимента, в котором лингвист систематически меняет параметры конструкций, чтобы выявить их влияние на суждения носителей, которые оценивают стимулы по качественным (выбор варианта) или количественным (шкала) критериям (Schütze, 1996; Герасимова, 2023). Ключевые преимущества метода

состоят в возможности изолировать отдельный грамматический фактор и количественно оценить силу эффекта, а значит, объективно подтвердить или опровергнуть гипотезу об устройстве грамматики.

Растущая сложность гипотез привела к повышению интереса к деталям процедуры в экспериментах на оценку приемлемости. Влияние особенностей дизайна на распределение оценок рассматривалось в серии сравнительных исследований. Проводилось сопоставление типа и размерности оценочной шкалы (Sprouse, Almeida, 2017; Langsford et al., 2018; Петелин 2020; Marty et al., 2020), модальности предъявления стимулов (Петелин, 2021), особенностей формулирования экспериментального задания (Vogel, 2019; Schoenmakers, 2023). Проведенные исследования показывают, что ни один из рассмотренных приемов в экспериментальном дизайне существенно не искажает оценки или контрасты, но эффективность разных подходов может зависеть от размера исследуемого эффекта и конкретного предмета исследования.

Вместе с тем, непосредственное воздействие на распределение оценок приемлемости способен оказывать сам экспериментальный материал. В первую очередь, как предполагает одна из гипотез, лингвисты могут непроизвольно искажать собственные суждения об исследуемых языковых феноменах под влиянием приверженности определённой научной теории — в особенности, если в её рамках уже сформировалось устойчивое представление о соответствующей синтаксической структуре. Экспериментальная проверка наличия подобного смещения суждений строится на межгрупповом дизайне, в котором распределение оценок приемлемости, данных лингвистами, сравнивается с оценками наивных носителей языка. Однако эмпирические данные на этот счёт противоречивы. С одной стороны, ряд исследований с использованием такого

дизайна не обнаружил существенных различий между группами (напр., Snow, Meier, 1977; Culbertson, Gross, 2009; Dąbrowska, 2010; Панченко, 2021). С другой стороны, в других работах статистически значимые различия были выявлены (напр., Gordon, Hendrick, 1997; Linzen, Oseki, 2018). Учитывая саму возможность подобного смещения и неоднозначность результатов, стандартной практикой для экспериментальной лингвистики стало включение вопроса о наличии у испытуемого или респондента лингвистического образования, что позволяет впоследствии учесть эту переменную при статистическом анализе (Schütze and Sprouse, 2014).

В литературе фиксируются еще два эффекта смещения оценок в зависимости от экспериментального материала. Задолго до становления методологии экспериментального синтаксиса Х. Нагата продемонстрировал на лингвистическом материале т.н. эффект якоря: наличие грамматичного или неграмматичного окружения целевых стимулов влияет на их оценки (Nagata, 1992). На материале японского языка было показано, что на фоне неграмматичных предложений оценки целевых стимулов завышаются по сравнению с полным отсутствием филлеров. При этом по сравнению с аналогичным эффектом в психофизических экспериментах наблюдаемое изменение слабое и однонаправленное: так, грамматичные филлеры никак не влияют на оценки. Позднее эффект якоря удалось воспроизвести в эксперименте на английском языке (Coward, 1994). Дизайн снова был межгрупповой, а изменения устанавливались с помощью однофакторного дисперсионного анализа для средних оценок стимулов.

Большой пласт исследований посвящен эффекту пресыщения, который определяется уже не контекстуальным окружением стимулов, а частотой их предъявления. Эффект преимущественно

рассматривался в контексте нарушения островных ограничений — грамматических запретов на выдвижение элементов из некоторых структурных единиц (напр., сложной именной группы, относительной клаузы и др., см. (Лютикова, Герасимова (ред.), 2021)). Чтобы контролировать порядок предъявления материала, в экспериментах на эффект пресыщения используются блоки, в которые объединяются уникальные экспериментальные условия (набор условий сохраняется от блока к блоку). В литературе встречается два способа определить наличие эффекта. Первый способ предполагает, что оценки в нескольких блоках усредняются и сравниваются между собой. Так был организован материал в основополагающей работе (Snyder, 2000): в каждом из пяти блоков было три грамматичных предложения и семь предложений с выдвижением из разных островов, а сравнение учитывало оценки в двух первых и двух последних блоках. В недавнем исследовании (Brown et al. 2021) сравнение проводилось между текущим блоком и средней оценкой для всех последующих. Второй же способ исключает усреднение оценок по блокам, и предполагает регрессионный анализ, в котором порядковый номер материала в экспериментальном листе учитывается как отдельный фактор. При этом количество повторений может варьировать от 5 или 7 (Hiramatsu, 2001; Braze, 2002; Crawford, 2012) и до 14 или 20 (Sprouse, 2007, 2009; Chaves, Dery 2014, 2019).

Результаты экспериментальных исследований эффекта пресыщения вновь неоднозначны. Начнем с того, что нет такого островного ограничения, для которого во всех экспериментах эффект подтвердился бы (см. обзор экспериментов в таблицах 5-6 в (Snyder, 2022)). Более того, для тех островов, для которых, казалось, эффект не проявляется, появляются новые данные, свидетельствующие об обратном.

Например, эффект пресыщения для предложений с нарушением острова адьюнкта обнаруживается в (Chaves, Putnam, 2020), но не в (Snyder, 2000; Hiramatsu, 2001; Francom, 2009; Sprouse, 2009; Crawford, 2012). Возможными причинами такого несоответствия являются особенности проведения исследований: авторы используют различные типы островов, меняющийся стимульный материал, несовпадающие шкалы приемлемости (бинарную или Ликерта), отличающиеся способы представления (напр., с ограничением времени и без, в сопровождении контекста или нет), разное количество повторений. В мета-исследовании эффекта для островных ограничений в английском языке (Lu et al., 2023) количественно подтверждается, что островные ограничения разного типа в разной степени подвержены эффектам пресыщения, причем для острова именной группы и острова косвенного вопроса получилось установить, что наличие контекста значимо увеличивает размер эффекта в отличие от количества повторений и типа шкалы.

В литературе выделяют несколько причин для возникновения эффекта пресыщения. Во-первых, технические: в (Sprouse, 2009) выдвигается гипотеза о том, что участники эксперимента стремятся к приблизительно равному количеству положительных и отрицательных оценок в эксперименте, из-за чего склонны давать положительные оценки в контексте островного материала. Однако результаты экспериментов с контролем за количеством грамматичных филлеров показывают, что эффект пресыщения при балансировании материала не исчезает (Francom, 2009; Snyder, 2022; Lu et al., 2022). Другие гипотезы связаны с ограничениями обработки предложений. Так, повторение структуры может снижать нагрузку на рабочую память и совпадать с эффектом прайминга (Francom 2009). Но в исследовании (Do, Kaiser, 2017)

лексический повтор, который обычно усиливает эффект прайминга, не оказал никакого влияния на эффект пресыщения. Другое предположение связывает эффект с идеей статистического научения: возможно, улучшение оценок возникает из-за временной повышенной активации синтаксической структуры в памяти респондента или адаптации к этой структуре (Lu et al., 2021).

Если пресыщение представляет собой форму имплицитного научения, следует ожидать, что оно будет проявляться и для вариативных явлений, где приемлемость изначально колеблется в некотором диапазоне. По замечанию (Brown et al., 2021) эффекты пресыщения характерны прежде всего для явлений, которые занимают срединную позицию на шкале приемлемости, а значит, не связаны исключительно с островными конструкциями. В данном исследовании мы впервые попробуем смоделировать изменения в оценках приемлемости для вариативного грамматического явления. Мы ожидаем, что частота предъявления вариантов может выступать фактором, сдвигающим языковые предпочтения индивида. В следующем разделе мы предложим материал для тестирования данной гипотезы.

3. Варьирование согласования при сочинении

При выборе материала для исследования был сформулирован ряд критериев. Во-первых, мы ориентировались на вариативные явления, демонстрирующие разные уровни приемлемости. Ключевым условием была независимость выбора варианта от грамматических или семантических предикторов, поскольку их наличие зачастую приближает выбор к однозначному. Кроме того, нас интересовали явления, оценки которых концентрируются в средней части шкалы приемлемости, поскольку полярные суждения могут быть в меньшей степени

подвержены эффектам смещения (Brown et al., 2021). Наконец, важное практическое соображение было связано с тем, что по феномену должны быть собраны экспериментальные данные, в том числе воспроизведенные в разных условиях.

В качестве такого явления мы выбрали предикативное согласование с сочиненным подлежащим. Речь идет о вариативности в выборе модели согласования сказуемого при подлежащем, состоящем из конъюнктов, соединенных союзом «и». При сочинении существительных возможны две стратегии: грамматическое согласование (форма множественного числа) и семантическое (форма единственного числа) (1). При сочинении местоимения и существительного добавляется также вариативность согласования по лицу (1/2 лицо vs. 3 лицо) (2).

- (1) а. *Философ и график **поднимаются** и садятся на стол, свешивая ноги в разные стороны.* (НКРЯ¹)
б. *Они не пахнут табаком, их одежда и дыхание **пахнет** свежестью и чистотой.* (НКРЯ)
- (2) а. *Мне никто не нужен, лишь бы **ты и Лиза были** дома.* (НКРЯ)
б. *И так саданут под микитки, Как **Спирин и я не посмел!*** (НКРЯ)
в. *Секретный код **знают** только **я и Сергей Петрович.*** (НКРЯ)
д. *Переяславцев на ужине балетоманов говорил с Коровиным, что он все записывает, что **делает Бооль и я**, желая обнаружить какие-то злоупотребления.* (НКРЯ)

О том, как распределяется приемлемость возможных вариантов согласования, накоплено достаточное количество экспериментальных данных. Хотя согласование по так называемым

правилам разрешения (множественное число, 3 лицо (1а, 2а)) практически всегда является наиболее приемлемым вариантом, альтернативные стратегии также становятся допустимыми при определенных параметрах предложения. К настоящему моменту подробно изучено влияние на выбор стратегии согласования по числу таких факторов, как порядок подлежащего и сказуемого (Давидюк, 2023, 2025; Белова, Давидюк, 2022, 2023) и расстояние между ними (Анисимова 2025), абстрактность/конкретность конъюнктов (Студеникина, 2023; Гриценко, 2024), их однородность (Belova, 2022; Лесняк, 2025), симметричность предиката (Паско, 2023), лексическая дистрибутивность (Гриценко, 2025). В масштабном исследовании Т.И. Давидюк также исследовано лично-числовое согласование с учетом типа союза, значений лица и числа конъюнктов, а также видовременных характеристик предиката, неэргативности или неаккузативности глагола, наличия приглагольного отрицания (Давидюк, 2025). Наша задача состоит в том, чтобы среди указанного многообразия экспериментальных данных определить целевые условия для исследования смещения оценок приемлемости в зависимости от кратности предъявления.

В отличие от экспериментов на эффект пресыщения, в которых, как правило, используется широкий набор предложений с различными типами нарушений, мы намеренно ограничиваемся минимальным набором условий — парой конкурирующих стратегий согласования. Такой подход приближает нас к моделированию ключевого механизма языкового изменения — грамматической конкуренции вариантов. Кроме того, рассмотрение пары стратегий снижает вероятность сложного взаимовлияния стимульного материала и упрощает статистическую модель, необходимую для подтверждения эффекта смещения оценок.

Мы видим следующие возможные пути в определении целевых конструкций.

¹ Здесь и далее примеры взяты из Национального корпуса русского языка (ruscorpora.ru) (Савчук и др., 2024).

Во-первых, нужно решить, должны ли два рассматриваемых варианта быть взаимозаменяемыми или нет. Поскольку именно конкуренция между вариантами представляет ключевой интерес при моделировании грамматических изменений, мы выберем стратегии, для которых нет различий в уровне приемлемости. Во-вторых, важно учесть положение пары вариантов на шкале приемлемости. Поскольку мы хотим проверить возможность смещения приемлемости в положительную сторону, не вполне удачным будет равенство по приемлемости грамматичным филлерам². В-третьих, возникает вопрос о том, какие это должны быть варианты, учитывая доминирующее положение правила разрешения. Заметим, что согласование по правилам разрешения совпадает по приемлемости с альтернативными вариантами в ограниченном числе случаев.

Учитывая сказанное, мы подобрали две пары условий с лично-числовым согласованием с сочиненным подлежащим, включающим местоименный и именной конъюнкты (*я и Вася / Вася и я*) из эксперимента 3а в работе (Давидюк, 2025) (см. также (Давидюк, 2023)). Во-первых, мы рассмотрим пару смежных по приемлемости условий, в которую входит согласование по правилам разрешения по числу и лицу (*придем я и Вася*), а также альтернативная стратегия — согласование с ближайшим конъюнктом-местоимением по лицу и числу (*приду я и Вася*). Во-вторых, мы рассмотрим пару стратегий, в которых согласование по лицу не

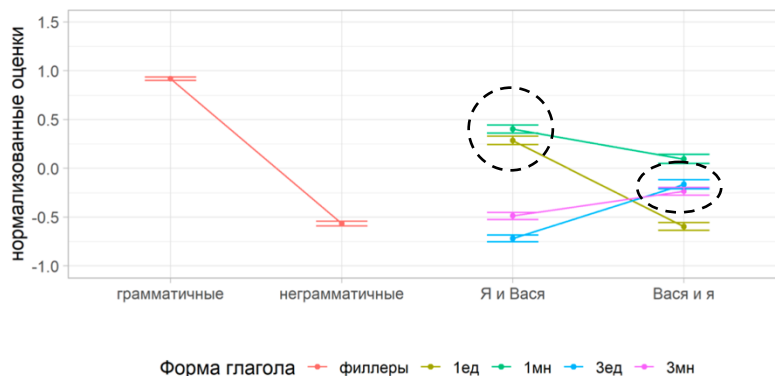
соответствует правилу разрешения и проходит по 3-му лицу, а числовое согласование варьирует (*придет / придут Вася и я*). Как можно заметить, для всех рассматриваемых условий характерен обратный порядок слов VS, а порядок конъюнктов в парах отличается. Подчеркнем, что отбор условий проводился из соображений различий в приемлемости, так что сопутствующие параметры предложений не подбирались. Обе пары занимают срединное положение на шкале приемлемости, вторая пара (*придет / придут Вася и я*) — ближе к полюсу неграмматичных филлеров (см. Рисунок 1). По регрессионному анализу с применением линейной смешанной модели и критерию Тьюки в обеих парах различия незначимы ($p = 0,83$ и $p = 0,96$ соответственно) (Давидюк, 2025: 125).

Рассмотрение сразу двух пар вариантов обусловлено следующим. Поскольку мы предполагаем, что возможное смещение оценок должно быть связано со статистическим научением, общие частотные характеристики вариантов могут модулировать эффект смещения. Соответственно, эффект может зависеть от распространенности варианта в грамматической системе: согласование по правилам разрешения более частотное, чем альтернативы (см. в том числе корпусные исследования (Давидюк, 2025; Пекелис, 2013а, 2013b)). Также мы считаем правильным рассмотреть различное положение вариантов на шкале приемлемости, поскольку оно также может быть связано с общей частотностью стратегий (см. исследования о взаимосвязи оценок и метрик частотности (Lau et al., 2017; Sprouse et al., 2018)). Поэтому экспериментальная часть исследования включает два параллельных эксперимента на разном материале.

² Грамматичные и неграмматичные филлеры призваны задавать полярные значения шкалы приемлемости. Ситуации, когда стимульный материал оказывается значимо более приемлемым, чем грамматичные филлеры, возможны, тем не менее, обычно они возникают в том случае, когда сами филлеры имеют осложненную структуру. Поскольку в данном случае мы не ожидаем какого-либо снижения приемлемости для филлеров, возникает риск получить т.н. эффект потолка (англ. *ceiling effect*), когда повышение приемлемости выше некоторого уровня станет невозможным.

Рисунок 1. Распределение оценок приемлемости в эксперименте, целевые пары условий отмечены пунктирными линиями (Давидюк, 2025: Рисунок 10).

Figure 1. Distribution of acceptability ratings, target condition pairs are indicated by dashed lines (adapted from (Davidyuk, 2025: Figure 10)).



4. Эксперименты

Цель экспериментов — проверить, как статистическое распределение входного сигнала влияет на соотношение приемлемости конкурирующих вариантов. Следовательно, независимой переменной должно быть соотношение частот двух вариантов согласования в стимульном материале. Мы выбрали пять уровней переменной, ориентируясь на следующее процентное значение частоты предъявления варианта: 15%, 30%, 50% (контрольное условие), 70% и 85%. Таким образом, влияние снижения/увеличения частоты предъявления на оценку приемлемости проверяется симметрично для обоих вариантов³. Было добавлено две градации частотности, чтобы определить, зависит ли размер эффекта от кратности показов или критична только асимметрия в частоте предъявления.

³ Такой подход позволяет контролировать влияние непосредственного варианта согласования на эффект смещения. Альтернативное решение по дизайну могло бы состоять в том, чтобы оставить три условия (15:85, 30:70; 50:50) и балансировать варианты (в одном листе вариант А имеет частоту 15%, в другом — вариант Б). Мы не стали так делать, чтобы не снижать мощность эксперимента и качество статистических моделей регрессии в том случае, если понадобится оценить, зависит ли эффект смещения от варианта согласования.

Мы использовали 24 лексикализации (т.е. конкретных предложения с разным лексическим наполнением) из эксперимента (Давидюк, 2025), с кратностью предъявлений 20:4, 16:8, 12:12, 8:16, 4:20 (первое число всегда соответствует согласованию по множественному числу, второе — по единственному). Дизайн был межгрупповой: один респондент получал анкету с определенным соотношением вариантов. По ходу эксперимента распределение вариантов было равномерное. В терминах экспериментов на эффект пресыщения в лист включалось 4 идентичных блока, в которых варианты чередовались друг с другом (3). Дополнительно, для того, чтобы исключить влияние лексики на оценки, применялось правило латинского квадрата: для каждой группы было подготовлено от 2 до 6 листов, в которых варианты смещались относительно лексикализаций (4-5).

- (3) a. А66666 – А66666 – А66666 – А66666
b. А66А66 – А66А66 – А66А66 – А66А66
c. А6А6А6 – А6А6А6 – А6А6А6 – А6А6А6
d. 6АА6АА – 6АА6АА – 6АА6АА – 6АА6АА
e. 6ААААА – 6ААААА – 6ААААА – 6ААААА
- (4) a. А6А6А6 – А6А6А6 – А6А6А6 – А6А6А6
b. 6А6А6А – 6А6А6А – 6А6А6А – 6А6А6А
- (5) a. А66666 – А66666 – А66666 – А66666
b. 6А6666 – 6А6666 – 6А6666 – 6А6666
c. 66А666 – 66А666 – 66А666 – 66А666
d. 666А66 – 666А66 – 666А66 – 666А66
e. 6666А6 – 6666А6 – 6666А6 – 6666А6
f. 66666А – 66666А – 66666А – 66666А

Чтобы отобрать 24 лексикализации из 32, использованных в эксперименте (Давидюк, 2025), было использовано два способа. Первый способ основан на анализе методом главных компонент, где лексикализации проецировались в пространство, определяемое первыми двумя главными компонентами, отражающими изменчивость статистических характеристик распределений (с помощью функции *prcomp()* в R (R Core Team, 2025)). Матрица данных, для которой выполнялся анализ, для каждой лексикализации включала среднее значение, медиану, стандартное отклонение и межквартильный размах нормализованных оценок. Отбор производился по критерию минимального евклидова расстояния до центра (средних значений) в данном пространстве, что обеспечивало выбор наиболее типичных представителей.

Второй способ использовал матрицу попарных расстояний между эмпирическими функциями распределений, представленными через ключевые квантили (5%, 25%, 50%, 75%, 95%). Лексикализации с наименьшими суммарными расстояниями до всех остальных рассматривались как имеющие максимальное сходство в форме распределений. Оба способа продемонстрировали высокую согласованность результатов: два набора *исключенных* лексикализаций включали 7 совпадающих предложений. Итоговое решение было принято по второму методу⁴ (Рисунки 2-3). В эксперименте Т.И. Давидюк также контролировалось соотношение лексикализаций по типу предикатов: в отобранном наборе лексикализаций оказалось 13 с неэргативами и 11 с неаккузативами. Примеры стимульных предложений приведены в (6-7).

⁴ Исключена лексикализация №25. Лексикализацию №29, которую можно было исключить по первому способу, оставили.

- (6) а. В двухместной палатке спим / сплю я и Вася.
 б. На первый этаж спускаемся / спускаюсь я и Максим.
 с. На театральную сцену выходим / выхожу я и Егор.
 д. В районном центре живём / живу я и Петя.
- (7) а. В двухместной палатке спят / спит Вася и я.
 б. На первый этаж спускаются / спускается Максим и я.
 с. На театральную сцену выходят / выходит Егор и я.
 д. В районном центре живут / живёт Петя и я.

Рисунок 2. Диаграмма размаха нормализованных оценок для лексикализаций в эксперименте (Давидюк, 2025).

Figure 2. Box plot showing the distribution of z-scores for lexicalizations in the experiment (Davidyuk, 2025).

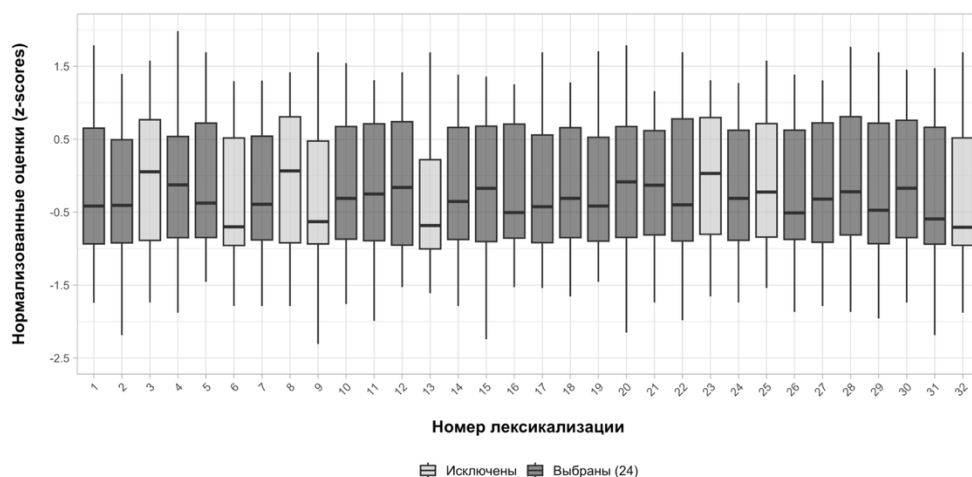
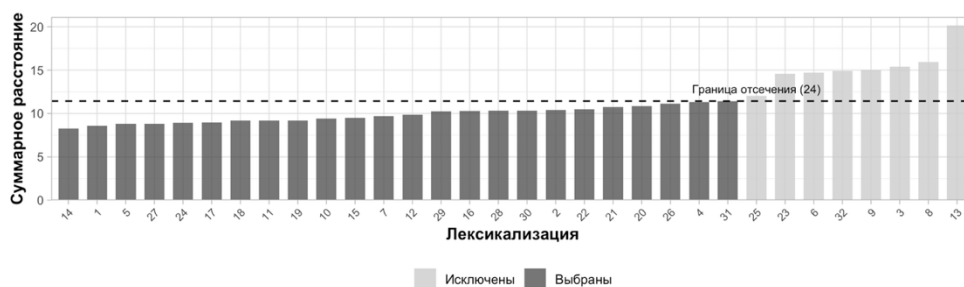


Рисунок 3. Гистограмма суммарных расстояний до других лексикализаций (по функциям распределений) в эксперименте (Давидюк, 2025).

Figure 3. Histogram of aggregate distributional distances between lexicalizations (Davidyuk, 2025).



В эксперимент были добавлены филлеры в соотношении к стимулам 1:1. В исходном эксперименте в филлерах использовалось согласование в настоящем времени с сочиненным подлежащим с

двумя конъюнктами, выраженными именами собственными (8). Причем в части неграмматических филлеров добавлялась ошибка в управлении (8b), а в части — согласование по 1-му лицу (8с).

Мы посчитали, что дополнительное использование форм согласования в настоящем времени в филлерах может исказить соотношение вариантов, которые чередуются в стимулах. Поэтому филлеры были модифицированы: предикаты

использовались всегда в прошедшем времени (9). В неграмматичных филлерах, как в части предложений оригинального эксперимента, добавлялась ошибка в управлении.

- (8) а. *По служебному телефону беседуют Яша и Лёша.*
б. *В грязной прихожих пылесосят Денис и Илья.*
д. *До лесной опушки ползём Федя и Митя.*
- (9) а. *По служебному телефону беседовали Яша и Лёша.*
б. *До лесными опушками ползали Федя и Митя.*

В качестве метода в экспериментах использовалась оценка приемлемости по шкале Ликерта от 1 до 7. Эксперименты были реализованы на платформе PCibex Farm (Zehr, Schwarz 2018). Стимульные предложения предъявлялись вместе со шкалой оценивания, время ответа ограничивалось 7 секундами, а интервал между стимулами составлял 1 секунду. Для контроля внимания участников к четырем филлерным предложениям был добавлен вопрос по содержанию с выбором из трех вариантов ответа. Сбор данных осуществлялся с помощью сервиса Яндекс.Задания⁵. Оплата за участие составила от 17 до 25 рублей, среднее время выполнения задания — 7 минут.

В экспериментах приняли участие 142 респондента, в эксперименте с условиями в 1-м лице — 69 человек и в эксперименте с условиями в 3-м лице — 73 человека. Из анализа были исключены 22 респондента по следующим критериям: отклонение от эталонных или средних оценок для тренировочных предложений или филлеров; некорректные ответы на контрольные вопросы; пропуск более 10 ответов; скорость вынесения оценки менее 1 секунды; использование только одного диапазона оценок из трех (низкие (1-3), средние (4-5), высокие (6-7)).

В результате отбора на каждую экспериментальную группу приходилось по 12 человек, а на каждый из экспериментов — по 60 респондентов. Внутри групп минимальное количество наблюдений на стимул было 48 (4 оценки на лист у 12 человек в условии 15%), максимальное — 240 (20 оценок в листе у 12 человек в условии 85%).

Обратимся к результатам экспериментов. Статистический анализ проводился с применением линейной смешанной модели регрессии в среде R (R Core Team 2025). Начальная модель включала в качестве фиксированных факторов СОГЛАСОВАНИЕ и КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ и их взаимодействие; как случайные факторы в модель включались варьирование отрезка и угла наклона для названных факторов и взаимодействий в зависимости от респондента и стимульного предложения. С помощью пакета *buildmer* (Voeten, 2020) проводился подбор максимальной модели, удовлетворяющий требованию сходимости. Затем сокращалась структура случайных эффектов⁶ (Bates et al., 2015) и позже — структура фиксированных эффектов с помощью теста отношения правдоподобия и информационных критериев (Gries 2021).

⁵ URL: <https://tasks.yandex.ru/> (дата обращения: 15.03.2026)

⁶ На основании анализа главных компонент оценок матрицы дисперсии-ковариации случайных эффектов (функция *rePCA()* в пакете *lme4*).

Для эксперимента с согласованием по 1-му лицу оптимальной по AIC оказалась модель: $z\text{-оценки} \sim 1 + \text{СОГЛАСОВАНИЕ} + (1 + \text{СОГЛАСОВАНИЕ} \mid \text{респондент}) + (1 \mid \text{предложение})$. Для эксперимента с согласованием по 3-му лицу оптимальной по тесту отношения правдоподобия и AIC оказалась модель: $z\text{-оценки} \sim 1 + \text{СОГЛАСОВАНИЕ} * \text{КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ} + (1 + \text{СОГЛАСОВАНИЕ} \mid \text{респондент}) + (1 + \text{СОГЛАСОВАНИЕ} \mid \text{предложение})$. Качество моделей по коэффициентам детерминации невысокое: для первой модели $R^2_m = 0,004$ и $R^2_c = 0,22$; для второй модели $R^2_m = 0,037$ и $R^2_c = 0,24$, что говорит о большом вкладе случайных эффектов.

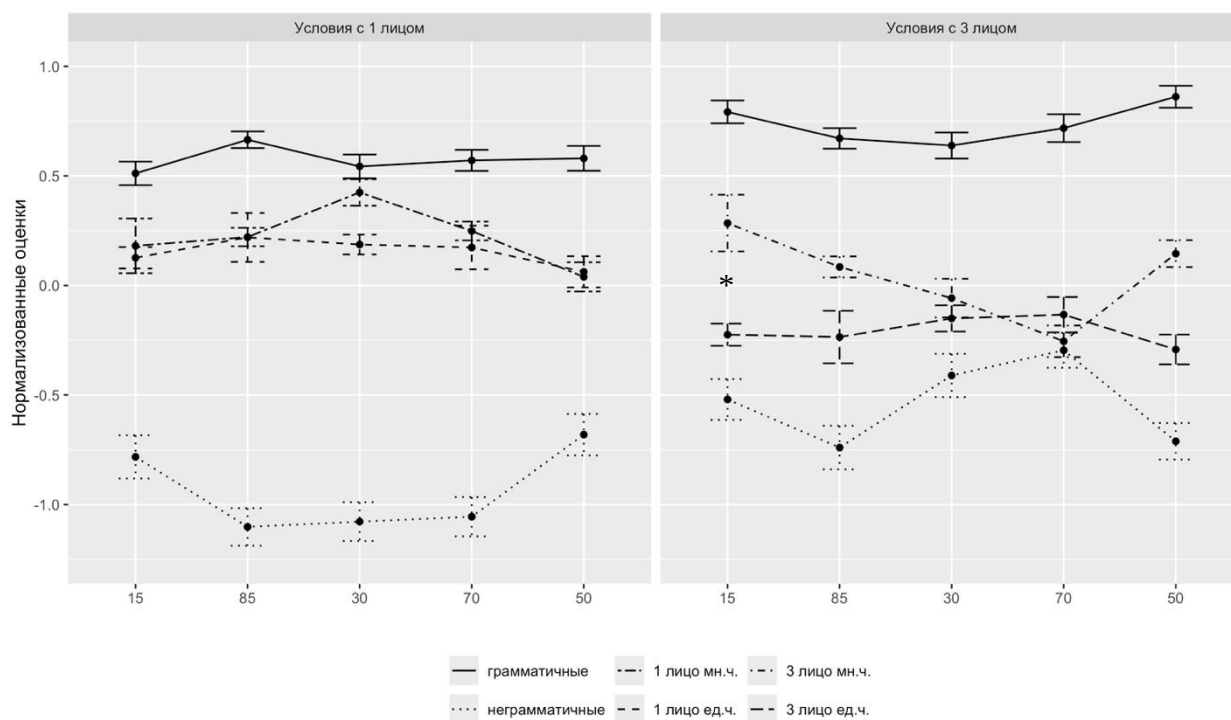
В модели для 1-го лица значимых эффектов не обнаружено. В модели для 3-го лица наблюдается значимый эффект факторов СОГЛАСОВАНИЕ $1\text{SG} \square 3\text{SG}$ ($\beta = -0,5$, $\text{SE} = 0,15$, $t = -3,36$, $p\text{-value} = 0,0011$) и КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ $15 \square 70$: $\beta = -0,54$,

$\text{SE} = 0,19$, $t = -2,91$, $p\text{-value} = 0,00467$). Значимым также оказалось взаимодействие СОГЛАСОВАНИЯ и КРАТНОСТИ ПРЕДЪЯВЛЕНИЯ (СОГЛАСОВАНИЕ $1\text{SG} \square 3\text{SG}$: КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ $15 \square 30$: $\beta = 0,43$, $\text{SE} = 0,2$, $t = 2,18$, $p\text{-value} = 0,033$; СОГЛАСОВАНИЕ $1\text{SG} \square 3\text{SG}$: КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ $15 \square 70$: $\beta = 0,66$, $\text{SE} = 0,2$, $t = 3,31$, $p\text{-value} = 0,0015$).

Множественные попарные сравнения Тьюки не выявили для первого эксперимента каких-либо различий между условиями. Для второго эксперимента с 3-м лицом значимым оказалось различие между оценками для множественного и единственного числа при соотношении 15 ($\beta = 0,51$, $\text{SE} = 0,151$, $t = 3,36$, $p\text{-value} = 0,0356$). Несмотря на кажущееся различие между приемлемостью числа при равном соотношении стимулов 3-го лица на Рисунке 4, значимого эффекта не выявлено.

Рисунок 4. Нормализованные оценки приемлемости на графике взаимодействия при разном соотношении вариантов в эксперименте; кодовое обозначение условия соответствует проценту стимулов множественного числа.

Figure 4. Interaction plot of z-scores by conditions; condition labels indicate the percentage of plural stimuli.



Сравнение с филлерами показывает в основном значимое различие между грамматическими и неграмматическими филлерами и целевыми стимулами, за исключением одного условия: в эксперименте на 3-е лицо при соотношении 70 оценки и для множественного, и для единственного числа не отличаются значимо от оценок для неграмматических филлеров (*t*-критерий Стьюдента, $t = 0.38$, $df = 308.56$, $p\text{-value} = 0.7$ и $t = 1.418$, $df = 222.11$, $p\text{-value} = 0.1576$ соответственно)⁷.

В соответствии с логикой эффекта пресыщения, можно было ожидать, что изменения в оценках приемлемости будут носить кумулятивный характер (т.е. усиливаться от блока к блоку). Кроме того, логично предположить, что на начальных этапах эксперимента эффект может не проявляться ввиду недостаточного

накопления смещения в оценке стимулов. В связи с этим мы проанализировали оценки во второй половине эксперимента (блоки 3 и 4) (Рисунок 5).

Для обоих экспериментов оптимальной по АИС и тесту отношения правдоподобия снова оказалась модель: $z\text{-оценки} \sim 1 + \text{СОГЛАСОВАНИЕ} + (1 + \text{СОГЛАСОВАНИЕ} \mid \text{респондент}) + (1 \mid \text{предложение})$. Но если в эксперименте с согласованием по 1-му лицу значимых факторов не оказалось, в эксперименте с согласованием по 3-му лицу оказался

⁷ Хотя по Рисунок 4 может создаться впечатление об отсутствии различий между оценками для 1-го лица множественного числа и грамматических филлеров при соотношении 30(70%), значимая разница в этом случае есть (*t*-критерий Стьюдента, $t = -2.498$, $df = 222.43$, $p\text{-value} = 0.0132$).

значимым фактор СОГЛАСОВАНИЕ $1SG \square 3SG$ ($\beta = -0,2$, $SE = 0,09$, $t = -2,32$, $p\text{-value} = 0,0237$). Это означает, что в данных этой части эксперимента оценки накладываются таким образом, что создаётся значимый эффект⁸. При этом ожидаемое смещение оценок в зависимости от соотношения конкурирующих вариантов во второй части эксперимента не обнаружено.

Учитывая блочную организацию экспериментального материала, мы также посчитали средние оценки для конкурирующих вариантов по блокам и провели разведывательный анализ эффекта пресыщения с помощью линейной смешанной модели регрессии⁹ (Рисунки 6-7). Ни для одного из экспериментов не обнаружено значимости взаимодействия факторов СОГЛАСОВАНИЕ, КРАТНОСТЬ ПРЕДЪЯВЛЕНИЯ и ПОРЯДОК БЛОКА¹⁰. Попарных различий также не обнаружено.

⁸ При интерпретации этого результата следует учитывать, что модель обладает малой объяснительной силой и низким качеством ($R^2_m = 0,016$ и $R^2_c = 0,36$).

⁹ Отметим методологическое ограничение подобного подхода: добавление дополнительного фактора увеличивает количество условий в модели и снижает количество наблюдений на условие, а следовательно, качество модели.

¹⁰ В оптимальной модели для эксперимента на 3-е лицо оказалось значимым взаимодействие при переходе от соотношения 15 к соотношению 30 и от блока 1 к блоку 4 ($p\text{-value} = 0,036$). Однако данное взаимодействие остается не интерпретируемым в нашей задаче, поскольку в нем суммируются оценки для двух альтернативных вариантов (т.е. фактор согласования никак не учитывается).

Рисунок 5. Нормализованные оценки приемлемости на графике взаимодействия во второй половине эксперимента (блоки 3 и 4) при разном соотношении вариантов в эксперименте.
Figure 5. Interaction plot of z-scores for the second half of the experiment by condition and block.

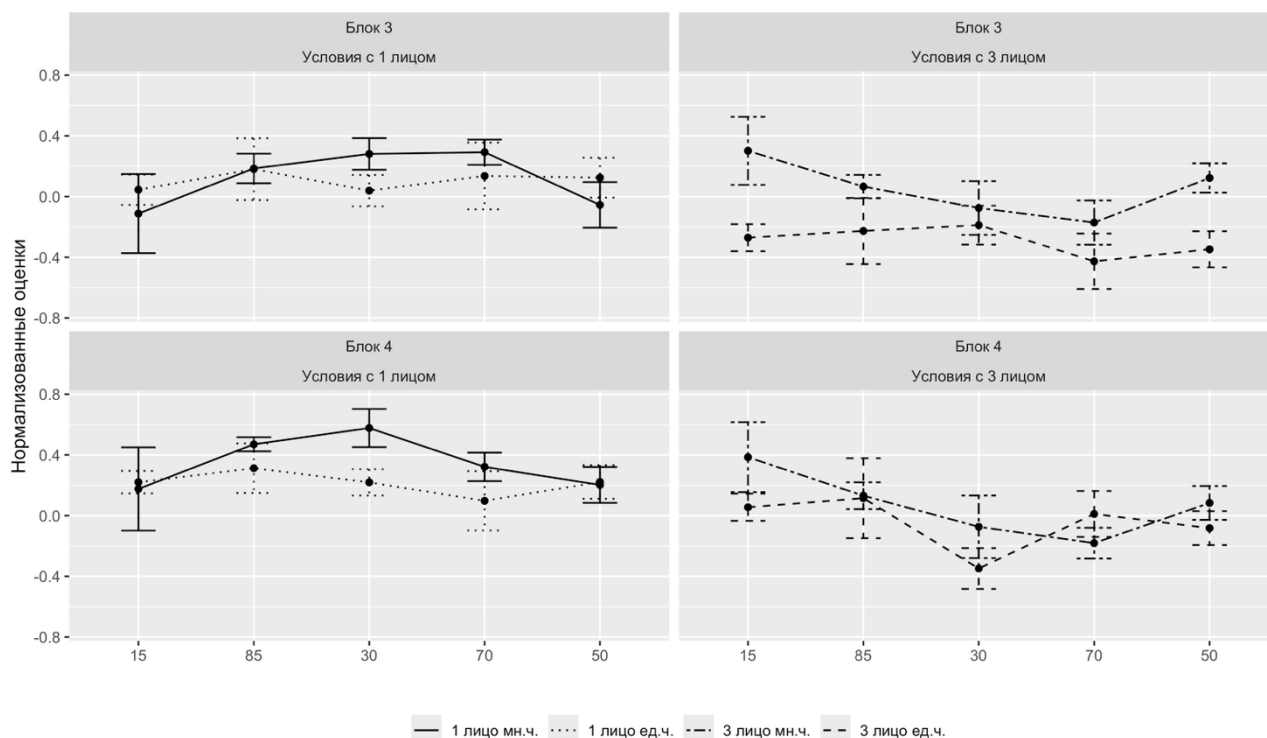


Рисунок 6. Нормализованные оценки приемлемости на графике взаимодействия по блокам (очередности показа) при разном соотношении вариантов в эксперименте (согласование по 1-му лицу)
Figure 6. Interaction plot of z-scores by condition and presentation order for first-person experiment

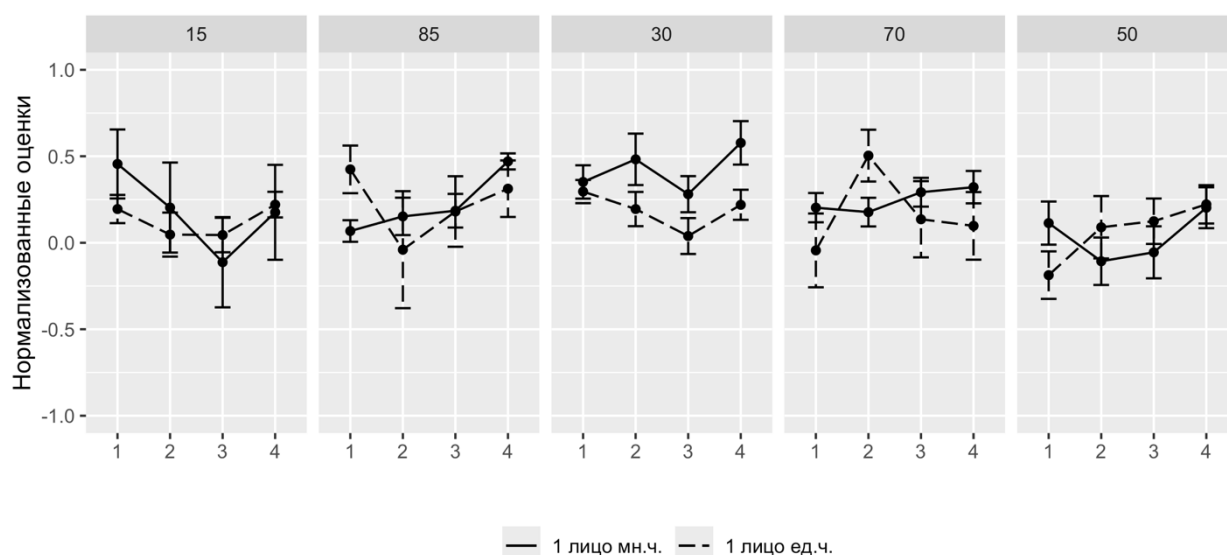
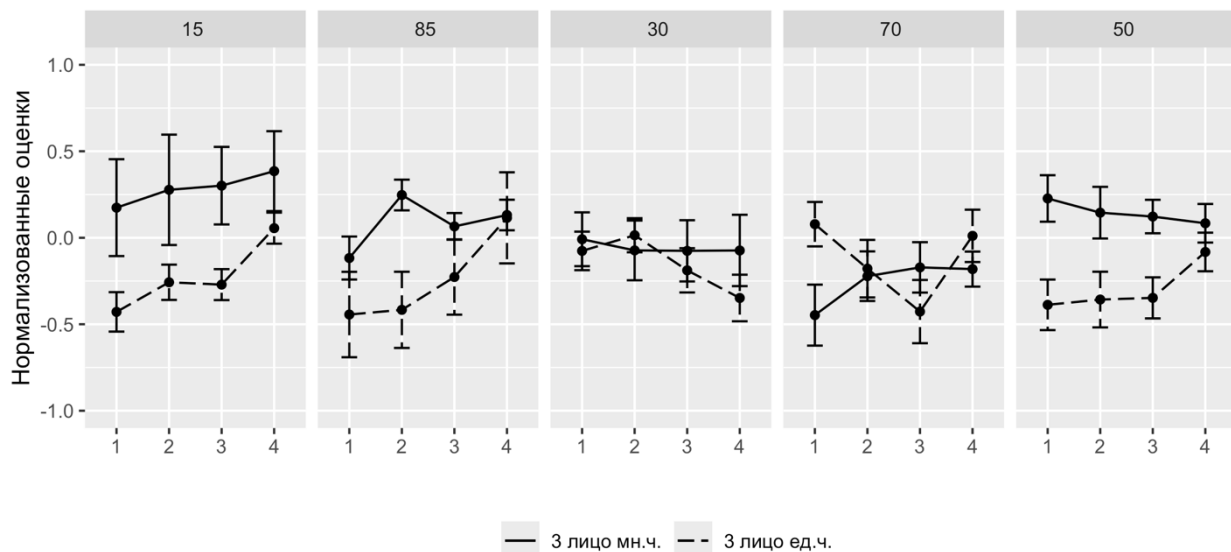


Рисунок 7. Нормализованные оценки приемлемости на графике взаимодействия по блокам (очередности показа) при разном соотношении вариантов в эксперименте (согласование по 3-му лицу)

Figure 7. Interaction plot of z-scores by condition and presentation order for third-person experiment



5. Обсуждение

Основной результат экспериментального исследования состоит в том, что нам удалось установить факт смещения оценок приемлемости, связанный с изменением статистических характеристик языковых данных, а именно — конкурирующих вариантов согласования с сочиненным подлежащим в русском языке. Однако гипотеза подтвердилась только частично. Смещение оценок обнаружено для одной пары вариантов — согласования по 3-му лицу (*придет / придут Вася и я*) и только в одном экспериментальном условии — при соотношении вариантов множественного и единственного числа 15(:85%). Причем в симметричном эксперименте с соотношением согласования 85(:15%) значимого различия в оценках вариантов нет.

Параллельные эксперименты были задуманы для сопоставления двух пар вариантов: двух допустимых альтернатив, которые получают наиболее высокие оценки по сравнению со всеми

остальными стратегиями согласования, и двух т.н. маргинальных вариантов, которые в исходном эксперименте Т.И. Давидюк получали средние оценки по шкале приемлемости. В первой паре можно было бы ожидать, что согласование по правилам разрешения (1-е лицо, множественное число), которое оказывается наиболее приемлемой стратегией в большей части контекстов с сочиненным подлежащим, получит более высокие оценки при повышении частоты предъявления. Однако ни в одном из условий мы не зафиксировали никаких изменений в оценках.

В паре маргинальных вариантов не действует правило разрешения согласования по лицу, с чем как раз связывается снижение оценок приемлемости. То, что именно для этой пары обнаружено смещение оценок, на первый взгляд согласуется с наблюдением из (Brown et al., 2021) о том, что другому типу смещения, эффекту пресыщения, подвержены прежде всего явления со срединной позицией на шкале

приемлемости. Впрочем, это сопоставление осложняется следующим. В указанной работе оценки никак не трансформировались и не было филлеров, задающих полюсы шкалы, так что за «срединное» принималось всё ниже оценки 6 по шкале 1–7. По такой логике в нашем исследовании смещения следовало ожидать и для первой пары вариантов, потому что эти предложения в исходном эксперименте тоже получали оценки, сниженные относительно грамматичных филлеров. Полученные данные указывают на то, что подверженность смещению, по-видимому, определяется не абсолютным положением на шкале приемлемости, а соотносительным уровнем приемлемости вариантов внутри конкретной парадигмы: смещению подвергаются менее приемлемые варианты, тогда как более приемлемые варианты демонстрируют бо́льшую устойчивость.

Вместе с тем собственно эффект пресыщения в наших данных не проявился. Это либо следствие методологических ограничений (недостаточная мощность статистической модели, ограниченное количество наблюдений, или неоптимальный способ подсчета), либо признак неуниверсальности эффекта, который проявляется не на любом материале и зависит от более специфических условий.

Дизайн экспериментов включал два уровня частотности, что позволило разграничить фактор асимметрии частот как таковой и кратность предъявления отдельных вариантов. Эффект смещения проявился при наиболее контрастном распределении частот: согласование по множественному числу, предъявляемое меньшее количество раз (15%) стало значимо более приемлемым, чем согласование по единственному числу, которое в экспериментальном листе предъявлялось чаще (85%). То, что оценки повысились для более редкого варианта, мы считаем неожиданным результатом, удовлетворительное объяснение которому

в рамках текущих представлений о статистическом научении или моделей грамматики, основанных на употреблении (англ. *usage-based*), отсутствует. Логичным для данных подходов был бы обратный эффект, когда повышается приемлемость более часто предъявляемого варианта. Неожиданно и то, что при обратном соотношении смещения не происходит.

Из полученных данных можно заключить лишь следующее: направление смещения не нейтрально. С одной стороны, это можно связать с тем, что мы имеем дело с пограничными по своей приемлемости вариантами, которые в силу своего промежуточного статуса оказываются уязвимыми к частотному воздействию и демонстрируют несимметричные сдвиги. С другой стороны, может оказаться, что нам не видна вся картина результатов эксперимента. Стандартный метод анализа экспериментальных данных всегда предполагает анализ усреднённой тенденции, которая возникает при агрегации данных всех респондентов. Такой подход, как отмечено в работе (Герасимова и др. 2024), может быть недостаточно адекватен для изучения областей грамматической вариативности, где индивидуальные стратегии играют ключевую роль. В связи с этим был проведен анализ индивидуальных различий в грамматических представлениях участников.

Мы использовали метод, адаптированный из подхода (Герасимова, Лютикова, 2022; Герасимова и др., 2024). В ответах каждого респондента для каждого варианта согласования от средней оценки отсчитывался интервал, определяемый стандартной ошибкой: $[z\text{-score}_{\text{mean}} - SE; z\text{-score}_{\text{mean}} + SE]$. Различие между вариантами считалось значимым на индивидуальном уровне, если соответствующие интервалы не пересекались. Анализ показывает, что при изменении соотношения вариантов результаты для двух экспериментов

оказываются достаточно стабильными (см. Таблицу 1): большая часть респондентов не делает различий между вариантами. Только в эксперименте с 1-м лицом в

условии 85(:15%) большая часть участников различает два варианта (выделено серым цветом).

Таблица 1. Распределение респондентов в зависимости от того, различаются ли оценки для вариантов, в двух экспериментах при разных условиях (соотношении вариантов).

Table 1. Distribution of respondents who did or did not differentiate between variants, across conditions and experiments.

	Различие	Эксперимент с 1-м лицом		Эксперимент с 3-м лицом	
		Нет	Есть	Нет	Есть
Условие	15	9 (75%)	3 (25%)	7 (58.3%)	5 (41.7%)
	30	6 (50%)	6 (50%)	9 (75%)	3 (25%)
	50	7 (58.3%)	5 (41.7%)	7 (58.3%)	5 (41.7%)
	70	8 (66.7%)	4 (33.3%)	8 (66.7%)	4 (33.3%)
	85	5 (41.7%)	7 (58.3%)	8 (66.7%)	4 (33.3%)
Эксперимент Т.И. Давидюк		55 (63.2%)	32 (36.8%)	52 (59.8%)	35 (40.2%)

В Таблице 2 можно увидеть предпочтения носителей, различающих варианты согласования. Количества данных недостаточно для статистического анализа, но качественный анализ не позволяет предположить, что рост частоты предъявления какого-либо варианта коррелирует с выбором соответствующей стратегии согласования. В таблицах для

справки мы приводим также данные по предпочтениям из начального эксперимента (Давидюк, 2025). Следует, однако, отметить, что распределение предпочтений в языковом сообществе в целом неизвестно, и существует вероятность, что состав выборок в разных экспериментах (и условиях) по этому параметру неоднороден.

Таблица 2. Распределение респондентов, различающих варианты, в зависимости от конкретных предпочтений в двух экспериментах при разных условиях (соотношении вариантов).

Table 2. Preference distribution among respondents who differentiated between variants, across conditions and experiments.

	Различие	Эксперимент с 1-м лицом		Эксперимент с 3-м лицом	
		PL > SG	SG > PL	PL > SG	SG > PL
Условие	15	2 (66.7%)	1 (33.3%)	5 (100%)	0
	30	4 (80%)	1 (20%)	3 (100%)	0
	50	3 (60%)	2 (40%)	5 (100%)	0
	70	1 (25%)	3 (75%)	1 (25%)	3 (75%)
	85	3 (42.9%)	4 (57.1%)	3 (75%)	1 (25%)
Эксперимент Т.И. Давидюк		17 (53.1%)	15 (46.9%)	12 (34.3%)	23 (67.7%)

Обратимся теперь к оценкам для филлеров. Важный результат состоит в том, что оценки для филлеров в разных условиях отличаются. В исследовании согласования по 3-му лицу

неграмматичные филлеры получили в среднем более высокие оценки, чем в эксперименте на согласование по 1-му лицу. Кроме того, при соотношении 70(:30%) в эксперименте на 3-е лицо

оценки для неграмматичных филлеров совпадают с оценками для целевых стимулов. Напомним, что филлеры из оригинального дизайна (Давидюк, 2025) были модифицированы: чтобы избежать нежелательного влияния повторяющихся грамматических форм на оценки вариантов согласования, формы предиката настоящего времени были заменены на

формы прошедшего времени. Общая изменчивость оценок для неграмматичных филлеров в новых экспериментах оказалась выше, что подтверждается большим значением межквартильного размаха по сравнению с исходным исследованием (Таблица 3). Для грамматичных филлеров подобных изменений не наблюдается.

Таблица 3. Значения стандартного отклонения и межквартильного размаха для оценок грамматичных и неграмматичных филлеров в двух экспериментах по условиям в сравнении с экспериментом Т.И. Давидюк.

Table 3. Standard deviation and interquartile range for grammatical and ungrammatical filler items across conditions in the two experiments, with comparison data from Davidyuk's experiment.

		Эксперимент с 1-м лицом					Эксперимент с 3-м лицом					Эксперимент Т.И. Давидюк
Условие		15	30	50	70	85	15	30	50	70	85	
грам.	SD	0.64	0.65	0.68	0.58	0.46	0.63	0.72	0.6	0.76	0.56	0.592
	IQR	0.73	0.37	0.85	0.47	0.47	0.74	0.52	0.4	1.09	0.31	0.517
неграм.	SD	1.19	1.06	1.14	1.08	1.03	1.12	1.19	1.00	0.955	1.19	0.915
	IQR	1.97	1.46	1.95	1.51	1.56	2.20	2.00	1.52	1.30	2.26	0.995

Таким образом, можно заключить, что суждения о приемлемости подвержены влиянию общего состава стимульного материала в эксперименте. Данный эффект проявляется в качественном изменении оценок неграмматичных филлеров в экспериментах с сокращенным набором экспериментальных условий (т.е. стратегий согласования) по сравнению с исходным дизайном. Маловероятно, что причины изменений связаны с фактором временной формы — тогда мы увидели бы аналогичную картину для грамматичных филлеров. Ключевым, по-видимому, является соотношение стимулов разного уровня приемлемости и сама структура их сопоставления в рамках эксперимента — все это влияет на процесс неявного сравнения языкового материала респондентами. Это напоминает эффект якоря, при котором уровень приемлемости филлеров может смещать оценки

приемлемости целевых стимулов (Nagata, 1992). Обнаружение в экспериментальном исследовании еще одного источника смещения оценок представляет собой значимый, хотя и побочный, результат, который дополняет общие представления о возможности смещения приемлемости и подтверждает, что суждения о приемлемости формируются не изолированно, а в зависимости от окружающего языкового контекста.

При интерпретации полученных данных важно учитывать некоторые методологические ограничения проведенного эксперимента. Во-первых, можно выделить сложности, связанные с параметрами выборки и статистическим моделированием. Так, при соотношении частот 15:85 количество наблюдений для вариантов, соответствующих 15%, составляет 4 на респондента, что существенно меньше, чем в других

наборах наблюдений. Далее, качество построенных статистических моделей в ряде случаев оказалось невысоким ввиду высокой вариативности в данных. Хотя число наблюдений на вариант и количество респондентов на группу или лист соответствует стандартам экспериментальной лингвистики, имеющегося объема наблюдений могло оказаться недостаточно для обнаружения эффекта смещения оценок в зависимости от количества предъявлений. Отсутствие эффекта пресыщения также может быть связано с недостатком статистической мощности.

Во-вторых, особого внимания требует дизайн исследования. В эксперименты включались только фрагменты полной парадигмы согласования с сочиненным подлежащим. Это решение корректно с точки зрения ожиданий насчет воспроизводимости результатов подобных экспериментов: если абсолютные значения приемлемости могут варьировать от эксперимента к эксперименту, то структура грамматических контрастов должна сохраняться. Но как мы увидели на примере неграмматичных филлеров, контрасты могут меняться под влиянием языкового материала в эксперименте. В связи с этим можно предположить, что включение в дизайн полного набора условий потенциально могло изменить результаты, хотя и сделало бы эксперимент непомерно громоздким.

В-третьих, стоит признать наличие неконтролируемых индивидуальных различий между респондентами и трудности в верификации их стратегий. Тщательный отбор респондентов не исключил случаев атипичного поведения, причины которого остаются неясными (см. напр., неразличение целевых стимулов и филлеров). Анализ индивидуальных стратегий также показал различия в предпочтениях носителей, которые не видны по характеристикам основной тенденции. С этим связано две

методологические проблемы: невозможность гарантировать однородность выборки по грамматическим профилям на этапе её формирования и отсутствие устоявшихся методов выделения таких профилей и использования этой информации в анализе.

6. Заключение

Основные результаты исследования заключаются в следующем. Во-первых, гипотеза о смещении оценок под влиянием частоты предъявления подтвердилась лишь частично. Варианты согласования по 1-му лицу, которые получают наиболее высокие оценки по сравнению со всеми остальными стратегиями согласования, продемонстрировали устойчивость к частотным манипуляциям: никаких различий в соотношении оценок приемлемости не зафиксировано. Эффект смещения обнаружен только для пары вариантов с согласованием по 3-му лицу и только при максимальной асимметрии частот (15% против 85%). При этом природа эффекта оказалась неожиданной и противоречивой: повышается приемлемость у редкого варианта, что противоречит предсказаниям моделей, основанных на употреблении. Это скорее указывает на артефакт¹¹, связанный со спецификой дизайна и особенностями

¹¹ Мы исходим из того, что суждения носителей языка не существуют в готовом виде до момента предъявления стимула, а конструируются под влиянием множества факторов: грамматических ограничений, частотных эффектов, прагматики и особенностей экспериментального контекста. Если понимать артефакт в широком значении (как побочный продукт деятельности), то и сами суждения о приемлемости можно считать артефактом эксперимента. В данной работе, однако, мы используем термин в более узком, статистическом смысле: артефакт как недостоверный результат, порожденный не изучаемой реальностью (в нашем случае как раз конструируемыми представлениями носителей о стимулах в конкретных условиях проведения эксперимента), а особенностями процедуры эксперимента.

выборки, нежели закономерность статистического научения.

Во-вторых, анализ индивидуальных стратегий показал, что усредненные данные маскируют существенную неоднородность в оценках носителей: большинство респондентов не различают конкурирующие варианты, а предпочтения тех, кто их различает, не обнаруживают корреляции с частотой предъявления.

Наконец, в качестве значимого побочного результата обнаружен эффект контекста: изменение состава стимульного материала привело к качественному изменению оценок неграмматичных филлеров, что указывает на наличие эффекта якоря и ставит вопрос о влиянии дизайна эксперимента на структуру грамматических контрастов.

Полученные данные также уточняют наши представления о моделях согласования с сочиненным подлежащим в русском языке. Прежде всего, подтверждена устойчивость стратегии согласования по 1-му лицу множественного числа как доминирующей: эта стратегия сохраняет свои позиции вне зависимости от распределения стимулов. Анализ индивидуальных различий показал, что вариативность в области согласования с сочиненным подлежащим существует не только между разными стратегиями, но и на уровне носителей: значительная часть респондентов не демонстрирует устойчивых предпочтений, что может свидетельствовать о наличии в идиолектах нескольких конкурирующих грамматических репрезентаций.

Для прояснения противоречивой картины, связанной с природой смещения оценок, в будущем необходимо изменить подход к исследованию. Перспективным представляется изучение смещения в ситуации, где изначально существует четкое, воспроизводимое различие в оценках между вариантами. Также кажется правильным сместить фокус на индивидуальную динамику, используя

логику экспериментов на эффект пресыщения, когда отслеживается изменение оценок у одного носителя. Это, однако, предполагает значительное увеличение масштаба эксперимента для обеспечения необходимой статистической мощности. Обнаруженный эффект контекста, по своей природе близкий к эффекту якоря, представляет собой самостоятельную проблему для методологии экспериментального синтаксиса, заслуживающую отдельного изучения.

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Анастасия Алексеевна Герасимова, кандидат филологических наук, научный сотрудник Научно-исследовательского вычислительного центра, Московский государственный университет имени М. В. Ломоносова, Москва, Россия.

Anastasia A. Gerasimova, Ph.D. (Linguistics), Researcher, Research Computing Center, Lomonosov Moscow State University, Moscow, Russia.

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Глухова О. В.¹ 

Пострелятивизм как новая парадигма в лингвистике:
библиометрический анализ

¹ Ростовский государственный экономический университет (РИНХ)
Б. Садовая, 69, Ростов-на-Дону, 344002, Россия
E-mail: olga_glukhova@mail.ru
ORCID: 0000-0003-4871-4144

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Аннотация: Актуальность настоящего исследования обусловлена становлением пострелятивизма как новой научной парадигмы в современной лингвистике. Этот подход, возникший на рубеже XX-XXI столетий, предлагает принципиально иной взгляд на взаимосвязь языка, мышления и культуры. Пострелятивизм, как ответ на ограничения классического универсализма и неорелятивизма, указывает на необходимость интегрального изучения когнитивных процессов в аутентичном социокультурном контексте, что делает комплексный анализ его текущего состояния и перспектив развития особенно востребованным.

Проблема заключается в том, что несмотря на растущее число теоретических и эмпирических исследований, посвящённых принципу лингвистической относительности, отсутствует обоснованное понимание структуры пострелятивистского поля, с точки зрения составляющих дисциплин, ядра и периферии, а также соответствия современных исследований теоретическим положениям о его междисциплинарности.

Цель работы заключается в верификации процесса формирования пострелятивизма как научной парадигмы посредством библиометрического анализа. В соответствии с протоколом PRISMA на основе базы данных OpenAlex был сформирован датасет из 1029 релевантных публикаций за период с 1998 по 2024 год. Визуализация и анализ данных, включая картирование совместной встречаемости ключевых слов (концептов, алгоритмически сгенерированных OpenAlex), для выявления понятийной структуры поля и анализа со-цитирования были проведены с использованием программного обеспечения VOSviewer.

В результате исследования удалось определить наиболее продуктивных авторов (П. Атанасопулос и П. Кей), влиятельные журналы (Frontiers in Psychology, Cognitive Science, Cognition) и ключевые научные центры. Анализ понятийной сети и ее картирование показали, что ядро поля составляют когнитивная лингвистика, психолингвистика и нейронауки, в то время как лингвистическая типология, антропология и теория воплощённого познания остаются на периферии. Тезис о междисциплинарности подтверждается частично, поскольку понятие лингвистической относительности в данном датасете в наибольшей степени представлено в работах, связанных с философией языка, психологией и компьютерными науками. Удалось установить пик активности предметного поля (2016 г.) с последующим спадом, который интерпретируется как возможная трансформация исследовательского ландшафта, требующего дальнейшего качественного анализа с учётом алгоритмической природы данных OpenAlex.

Проведённый анализ подтверждает факт становления пострелятивизма, но указывает на неравномерность его развития как с точки зрения междисциплинарности, так и в отношении соответствия теоретической программе. Полученные результаты не только описывают текущее состояние поля, но и чётко обозначают его перспективные направления, разработка которых будет способствовать формированию пострелятивизма как одной из ведущих программ в науке о языке.

Ключевые слова: Пострелятивизм; Лингвистическая относительность; Библиометрический анализ; Протокол PRISMA; VOSviewer; OpenAlex

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Olga V. Glukhova¹ 

**Post-Relativism as a New Paradigm in Linguistics:
A Bibliometric Review**

¹ Rostov State University of Economics (Rostov Institute of National Economy),
69 B. Sadovaya St., Rostov-on-Don, 344002, Russia
E-mail: olga_glukhova@mail.ru
ORCID: 0000-0003-4871-4144

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Abstract: The relevance of the study is determined by the emergence of post-relativism as a new scientific paradigm in modern linguistics. This approach, originating at the turn of the 21st century, offers a fundamentally different perspective on the relationship between language, thought and culture. As a response to the limitations of classical universalism and neo-relativism, post-relativism highlights the need for an integrated study of cognitive processes within an authentic socio-cultural context. That makes a comprehensive analysis of its current state and development prospects particularly pertinent.

The problem is that despite the growing number of theoretical and empirical studies devoted to the linguistic relativity principle, there is no substantiated understanding of postrelativism's structure in terms of its constituent disciplines, its core and periphery, nor the correspondence between current research and the theoretical claims about its interdisciplinarity.

The aim of this paper is to verify the process of postrelativism's formation as a scientific paradigm through bibliometric analysis. In accordance with the PRISMA protocol, a dataset of 1029 relevant publications from 1998 to 2024 were compiled based on the OpenAlex database. Data visualization and analysis, including co-citation analysis and keyword co-occurrence mapping (using concepts algorithmically generated by OpenAlex) to identify the conceptual structure of the field, were performed using VOSviewer software.

The study resulted in identifying the most productive authors (P. Athanasopoulos, P. Kay), influential journals (Frontiers in Psychology, Cognitive Science, Cognition), and key research centers. Conceptual network analysis and mapping revealed that the core

of the field consists of cognitive linguistics, psycholinguistics, and neuroscience, while linguistic typology, anthropology, and embodied cognition theory remain on the periphery. The interdisciplinary thesis is partially confirmed, as linguistic relativity is most prominently represented in this dataset in papers related to philosophy of language, psychology and computer science. A peak in the field activity was established (2016), followed by a decline, which is interpreted as a possible transformation of the research landscape requiring (considering the algorithmic nature of OpenAlex data) further qualitative analysis.

The analysis confirms the emergence of post-relativism, but points to the unevenness of its development, both in terms of interdisciplinarity and its alignment with the theoretical program. The obtained results not only describe the current state of the field but also clearly outline its promising directions, the exploration of which will contribute to the establishment of post-relativism as one of the leading research programs in modern linguistics.

Key words: Post-relativism; Linguistic relativity; Bibliometric analysis; PRISMA protocol; VOSviewer; OpenAlex

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Введение

Последние десятилетия развития науки о языке характеризуются возрождением интереса к проблемам взаимосвязи языка и познания. Исследование данной проблематики чаще всего ведётся в рамках гипотезы Сепира-Уорфа (Whorf, Carroll, 1956) Согласно данной гипотезе, структура языка определяет когнитивность. Однако рост числа эмпирических исследований в области когнитивной лингвистики, лингвистической и когнитивной антропологии, а также когнитивных нейронаук привёл к необходимости пересмотра господствовавших на протяжении долгого времени теорий, описывающих взаимоотношения этих феноменов и их значимость. Сегодня обращение к релятивизму обуславливается такими тенденциями как «конструктивизм, преодоление коммуникативистского взгляда на язык, признание роли телесности и социокультурного опыта в формировании познавательных способностей, ориентация на кросс-культурный анализ» (Бородай, 2020: 10). Целью такого подхода является определение места языка «в структуре

когнитивности» (там же) с учётом социокультурных особенностей носителей. Такой подход к исследованию триады «язык – познание – культура» определяется как пострелятивистский и набирает все большее число последователей как в лингвистике, так и в смежных областях когнитивной науки. Попытки осмыслить накопленный материал были предприняты в обзорах, освещающих взаимосвязь культурных различий и образа мышления (Ishii, 2013), указывающих на необходимость инклюзивного подхода, предполагающего представленность различных языков и культур в когнитивной психологии (Gutchess, Rajaram, 2023) и когнитивной лингвистике (Blasi et al., 2022), а также более частных вопросов, таких как влияние грамматической категории рода на когнитивность (Samuel et al., 2019) и проблемы когнитивной типологии в аспекте языкового разнообразия (Glukhova, 2025; Glukhova, Dekhnich, 2025). Особый интерес представляет обзорная статья (Tierry, 2016), посвящённая нейролингвистическим аспектам взаимосвязи языка, восприятия и

познания, в которой эта связь постулируется априори.

Несмотря на активное развитие идей пострелятивизма, увеличение числа эмпирических исследований и аналитических работ, статус пострелятивизма как целостной научной парадигмы остаётся неопределённым. Отсутствует понимание структуры данного предметного поля, его ядра и периферии, и что еще более важно, – соответствует ли вектор современных исследований теоретическим положениям о междисциплинарности и новизне пострелятивистского подхода. Ключевой проблемой является необходимость верификации теоретических представлений о пострелятивизме через анализ структуры научных и понятийных связей.

В настоящем исследовании, целью которого является верификация процесса формирования пострелятивизма как научной парадигмы, проводится библиометрический анализ наиболее современных работ, выполненных с позиций принципа лингвистической относительности, на предмет выявления основных тенденций и положений данной предметной области и описывается современное состояние пострелятивистской парадигмы в лингвистике. Исследование направлено на критическое осмысление основных тенденций и акторов данной предметной области, анализ ее структуры, с точки зрения включения различных дисциплин, а также сопоставление выявленных кластеров знания с теоретическими положениями пострелятивистской программы (Бородай, 2020).

Поставленная цель предусматривает решение следующих задач: представить краткий обзор этапов развития идей релятивизма после Э. Сепира и Б. Уорфа; осуществить библиометрический анализ исследований (в соответствии с протоколом PRISMA (Page et al., 2021)), размещённых в научной базе данных

OpenAlex (Priem et al., 2022) за период с 1998 по 2024 г. с визуализацией и картированием в приложении VOSviewer (Van, Waltman, 2014); проанализировать карту понятийной структуры поля и сопоставить полученные кластеры с пунктами пострелятивистской исследовательской программы; определить перспективные направления дальнейших исследований. Проведённое исследование призвано дать ответы на следующие вопросы:

1. Какова исследовательская эффективность и понятийная структура пострелятивистского поля и какие научные направления формируют его ядро и периферию?

2. Подтверждается ли тезис о междисциплинарности в рамках исследуемой парадигмы?

3. Какие перспективные направления и пробелы могут быть идентифицированы на основе анализа структуры понятийной сети?

1. Обзор основных этапов развития релятивизма в лингвистике

Обращение к проблеме релятивизма в лингвистике чаще всего связано с использованием идей, высказанных в работах Э. Сепира (Sapir, 1921) и Б. Уорфа (Whorf, 1941) на заре XX столетия. Известная в науке как «гипотеза лингвистической относительности» или «гипотеза Сепира – Уорфа», традиция осмысления взаимосвязи и взаимозависимости мышления и языка, долгое время имевшая столько же сторонников, сколько и противников, сегодня, в условиях бурного развития когнитивной науки, получает все большее признание в научном сообществе как в России, так и за рубежом, где в условиях долгого господства классической когнитивной науки лингвистический релятивизм признавался несостоятельным и псевдонаучным. Ситуация изменилась в конце XX века, когда идеи Э. Сепира и Б. Уорфа были реинтерпретированы в свете достижений когнитивной

лингвистики (Дж. Лакофф (Lakoff, 1987), Р. Лангакер (Langacker, 1976), Л. Талми, (Talmy, 1983), Э. Рош (Rosch, Lloyd, 1978) и др.) и лингвистической антропологии (С. Левинсон (Gumperz, Levinson, 1996), Д. Слобин (Slobin, 1996), Дж. Люси (Lucy, 1992, 1996)). Этот период именуется периодом становления неорелятивизма.

1.1. Неорелятивизм

В рамках неорелятивизма, основные положения которого сформулированы в работах Дж. Люси (Lucy, 1992; 1996a; 1996b; 1997), понятие лингвистической относительности, трактовавшееся ранее исключительно в традициях американского структурализма, становится шире и включает себя не только структурную относительность, но также семиотическую и дискурсивную. Семиотическая относительность определяется символической природой языкового знака (в понимании Ч. Пирса (Peirce, 1966)), характеризующегося гибкостью, динамичностью и разнообразием. Дискурсивная относительность, по мнению Дж. Люси, связана с разнообразием дискурсивных практик, даже внутри одного языка (социальные, функциональные и др. различия). Опираясь на различия между данными типами относительности Дж. Люси предлагает свою исследовательскую программу и разрабатывает экспериментальную модель (Lucy, 1996) исследования языков с использованием сопоставительного межъязыкового анализа, экспериментальных методов обнаружения особенностей когнитивности в условиях языковой вариативности, методов полевой лингвистики, позволяющих выявить взаимосвязь специфики языка, особенностей восприятия и социального взаимодействия (Lucy, 1997).

Другой важной вехой развития релятивистских идей стало появление исследовательского проекта по когнитивной антропологии, посвящённого изучению взаимосвязи языка и

когнитивности в Институте Макса Планка (Дания), под руководством С. Левинсона с 1994 по 2017 гг. Полемизируя с имеющими большое влияние представителями нативизма Н. Хомского на тему универсальности оснований языка и мышления, С. Левинсон (Levinson, 2003) упрекает их в пренебрежении культурными и языковыми различиями и указывает на необходимость междисциплинарного подхода (объединяющего когнитивную антропологию, лингвистику и психологию) к решению проблемы взаимосвязи языка и познания. Вместе с тем С. Левинсон не отказывается от «психического единства человечества» и указывает на наличие двух уровней ментального кодирования: семантического и концептуального. Концептуальный уровень формируется в результате универсального для всего человечества «земного» опыта взаимодействия со средой. При этом высшим является семантический уровень, где и наблюдаются лингвоспецифичные эффекты, проявляющиеся как в лексике, так и в грамматике. С. Левинсон отмечает, что «семантические параметры не универсальны, то есть они не используются всеми языками. Если язык игнорирует какой-либо семантический параметр, существует большая вероятность того, что говорящий на этом языке будет не способен мыслить в пределах этого параметра» (Levinson, 2003: 302: цит. по Бородай, 2020: 208). Так, наличие в языке показателей грамматических классов имен предметов, требует перманентного знания о составе каждого класса и признаков элементов, входящих в имеющиеся в языке категории. Ср. классификаторы в языке дьирбал, описанные Р. Диксоном (Dixon, 1972) и переосмысленные Дж. Лакоффом (Lakoff, 1987).

Результатом работы этой исследовательской группы стали многочисленные монографии, научные статьи (перечень всех научных работ можно найти на странице проекта The

Language and Cognition Department¹), ряд конференций, посвящённых переосмыслению проблемы лингвистической относительности и возрождение интереса к проблематике релятивизма. К числу своих достижений участники проекта относят рост интереса к глубокому пониманию значимости культурного разнообразия, как одного из главных факторов в процессе адаптации. Группой также были разработаны методики, алгоритмы и протоколы для проведения сопоставительных исследований семантики и прагматики², которыми сегодня пользуются учёные во всем мире.

Несмотря на экспериментальные и полевые достижения неорелятивистов, особенно в области пространственной ориентации (Levinson, 2003), сосредоточенность только на одной коммуникативной системе (языке), по мнению С.Ю. Бородай (2020), имеет ряд ограничений и не позволяет обрисовать полную картину взаимодействия языка и когниции. Причину этого автор видит в неверном истолковании наследия Б. Уорфа, приведшем к возникновению так называемых «слабой» и «сильной версий» гипотезы.

1.2. Переход к пострелятивизму

Переломным моментом в понимании идей Б. Уорфа стала монография П. Ли «The Whorf Theory Complex. A Critical Reconstruction» (Lee, 1996), в которой автор представила его наследие в двенадцати тезисах. Основополагающим в теории Б. Уорфа, по мнению П. Ли, является понятие «языкового мышления» (linguistic thinking), которое трактуется как «локус пересечения языкового и концептуального» (Бородай, 2020: 77), где

концептуальность понимается как деятельность по порождению смысла, а язык выступает как матрица для хранения взаимосвязанных ментальных структур. Другими словами, когнитивность зависит от языка не полностью, как утверждалось в «сильной» версии гипотезы, а лишь в области языкового мышления. Именно в непонимании этого момента и заключалась основная проблема как последователей, так и критиков Б. Уорфа. Кроме того, Б. Уорф признает существование универсальных «изолятов опыта» (isolates of experience), возникающих в процессе восприятия, из которых «избирательным способом формируются «изоляты значения» (isolates of meaning) (Бородай, 2020: 76). В этом процессе роль языка заключается в сегментации опыта (который по замечанию П. Ли не является хаотичным, но уже организованным в сознании) и определении значимых и периферийных «пучков опыта» (bits of experience). Таким образом, сегментация опыта оказывается культурно-специфичной, в силу культурных различий самого опыта, и лингвоспецифичной в силу ограниченного репрезентативного потенциала каждого конкретного языка. С.Ю. Бородай отмечает, что такой подход позволяет рассматривать теорию Б. Уорфа не как гипотезу, требующую доказательства, но как принцип лингвистической относительности, который не требует доказательств и звучит следующим образом: «одни и те же феномены реального мира, уже будучи структурированы универсальными перцептивными механизмами, приобретают новую смысловую организацию в мышлении человека, которое направляется конфигурацией конкретного языка; в результате носители разных в структурном плане языков мыслят и описывают эти феномены по-разному» (Бородай, 2020: 216).

Такое понимание идей Б. Уорфа приводит к необходимости выработки иного подхода к изучению взаимодействия

¹ Max Plank Institute for Psycholinguistics. URL: <https://www.mpi.nl/page/former-departments-and-groups> (дата обращения: 15.03.2026)

² Field Manuals. URL: https://archive.mpi.nl/tla/islandora/object/lat:1839_00_0000_0000_0021_DC42_E?asOfDateTime=2023-06-21T18:31:48.627Z (дата обращения: 15.03.2026)

языка и когнитивности, который С. Ю. Бородай именует пострелятивистским и программу которого представляет в своей статье «Язык и познание: пострелятивистская исследовательская программа» (Бородай, 2019; 2023). Данная программа предлагает интегральное изучение «языка и когнитивности в аутентичных социокультурных условиях» (Бородай, 2020; 14). В рамках данного подхода исследование «места языка в когнитивной архитектуре» (там же) конкретного сообщества в конкретном культурном контексте должно учитывать достижения неорелятивистов, данные современной антропологии, типологии, когнитивной лингвистики, симуляционной семантики, психологии развития (там же). Также значимым для исследований последних лет является обращение к теоретическим положениям теории воплощённого познания, которая вносит значительный вклад в понимание и решение релятивистской проблематики сегодняшнего дня.

В следующей части статьи будет проведён систематический библиометрический обзор современных публикаций с целью выявления структуры пострелятивистских направлений и трендов.

2. Библиометрический обзор

2.1. Этапы и критерии отбора источников

Для решения поставленных задач и в целях соответствия критериям воспроизводимости и проверяемости исследование проводилось по методологии PRISMA (Page et al., 2021), которая предполагает реализацию следующих этапов: постановка исследовательского вопроса; этап поиска литературы; этап отбора релевантных источников; этап извлечения данных; этап обобщения и представления результатов.

Поиск источников для библиометрического обзора проводился в открытой базе научной литературы

OpenAlex (Priem et al. 2022), содержащей более 250 миллионов записей. В результате поиска по ключевым словам «*linguistic*» AND «*relativity*» было получено 28 770 результатов, которые были подвергнуты дополнительному отбору в соответствии со следующими критериями:

– *годы публикации* – с 1998 по 2024.

Ориентировочной точкой отсчёта для данного библиометрического анализа стала упомянутая ранее (раздел 1.2.) публикация П. Ли «The Whorf Theory Complex. A Critical Reconstruction» (Lee, 1996), с учётом времени необходимого для знакомства научного сообщества с работой;

– *тип источника* – для исследования были использованы только статьи в научных журналах, монографии, главы в коллективных монографиях;

– *тематическая область* – в настройках OpenAlex были выставлены фильтры, позволяющие исключить исследования из любых тематических областей кроме следующих: категоризация; восприятие и язык; язык, метафора и когнитивность. Выбор данных тематических областей обусловлен спецификой элементов пострелятивистской исследовательской программы (Бородай 2019; 2023);

– *ключевые слова*, были сгенерированы большой языковой моделью, встроенной в OpenAlex на основе автоматического анализа заголовков и аннотаций публикаций, входящих в тематические области³. Такого рода алгоритмическая обработка, основанная на иерархической системе тематической классификации, позволяет группировать семантически близкие работы, смягчает проблему синонимии, но не лишена недостатков, в том числе, как отмечено в руководстве (см. сноску), все

³ OpenAlex technical documentation. Электронный ресурс. Режим доступа: <https://docs.google.com/document/d/1bDopkhuGieQ4F8gGNj7sEc8WSE8mvLZS/edit#heading=h.5w2tb5fcg77r>

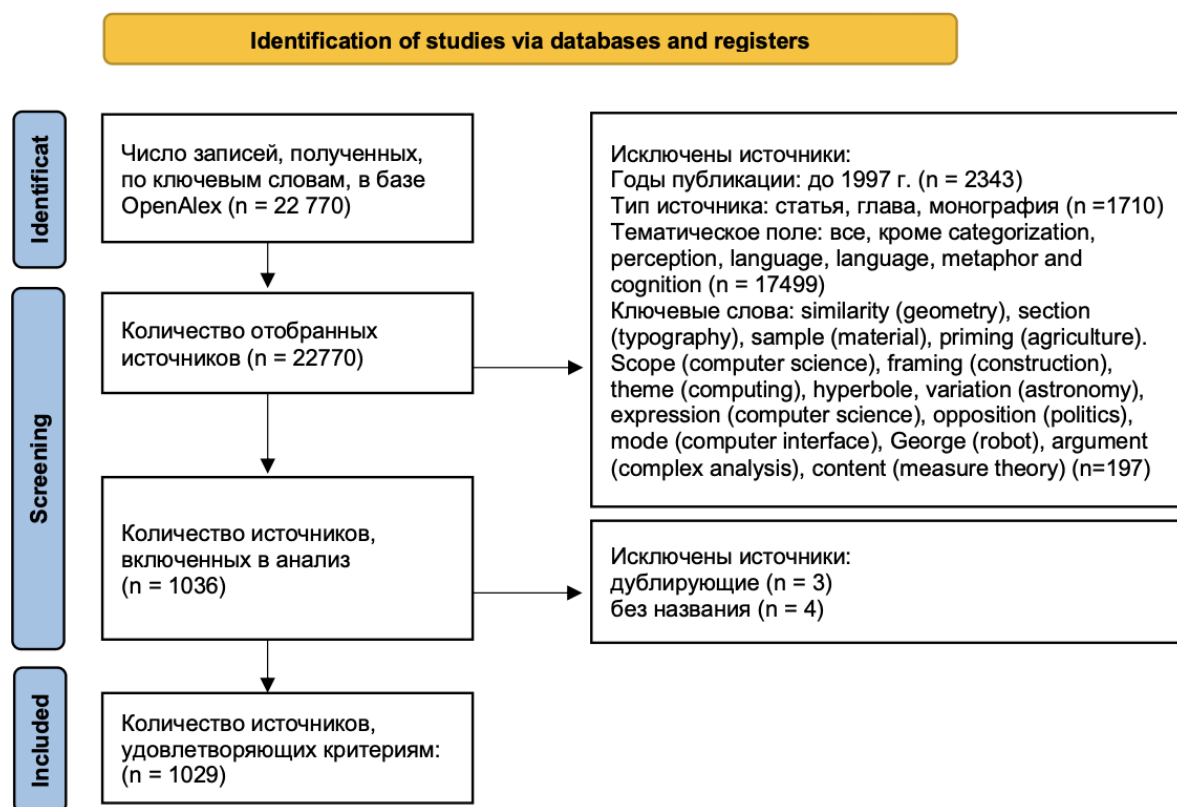
ещё уязвима с точки зрения категоризации, терминологической неоднозначности и предвзятостей, характеризующих языковые модели.

Далее из полученного списка были вручную исключены те, которые заведомо не связаны с исследуемой областью (например, математические термины – см. Рисунок 1), дополнительная коррекция не предполагалась во избежание излишней субъективности. Для картирования и интерпретации поля был предпринят кластерный анализ (анализ групп семантически близких терминов), выполненный на основе визуализаций, созданных при помощи инструмента VOSviewer. Следует подчеркнуть, что понятийная сеть, визуализируемая с помощью VOSviewer, отражает не только структуру научного поля, но и особенности алгоритмической

кластеризации OpenAlex, что накладывает определённые ограничения на интерпретацию результатов. Кроме того, как отмечается в документации OpenAlex, не все аннотации статей базы пригодны для анализа, что также накладывает ограничения на полноту и качество данных, особенно для публикаций, использующих альтернативные латинице системы письма.

Следующий этап предполагал анализ эффективности предметной области, оценивающий вклад участников исследований в данную область (учитывались: общее количество публикаций, распределение по годам, цитируемость, распределение по журналам, странам и т.д. – Рисунки 2, 3, 4).

Рисунок 1. Алгоритм отбора работ по протоколу PRISMA
Figure 1. PRISMA flow diagram



Для дальнейшего исследования, на этапе загрузки в программное

обеспечение VOSviewer, из выборки были исключены дублирующие публикации (3

шт.) и публикации без названий (4 шт.). Таким образом было отобрано 1029 источников, для дальнейшего анализа с целью кластеризации и создания понятийной сети исследуемого поля на основе метаданных.

3. Результаты: анализ и визуализация

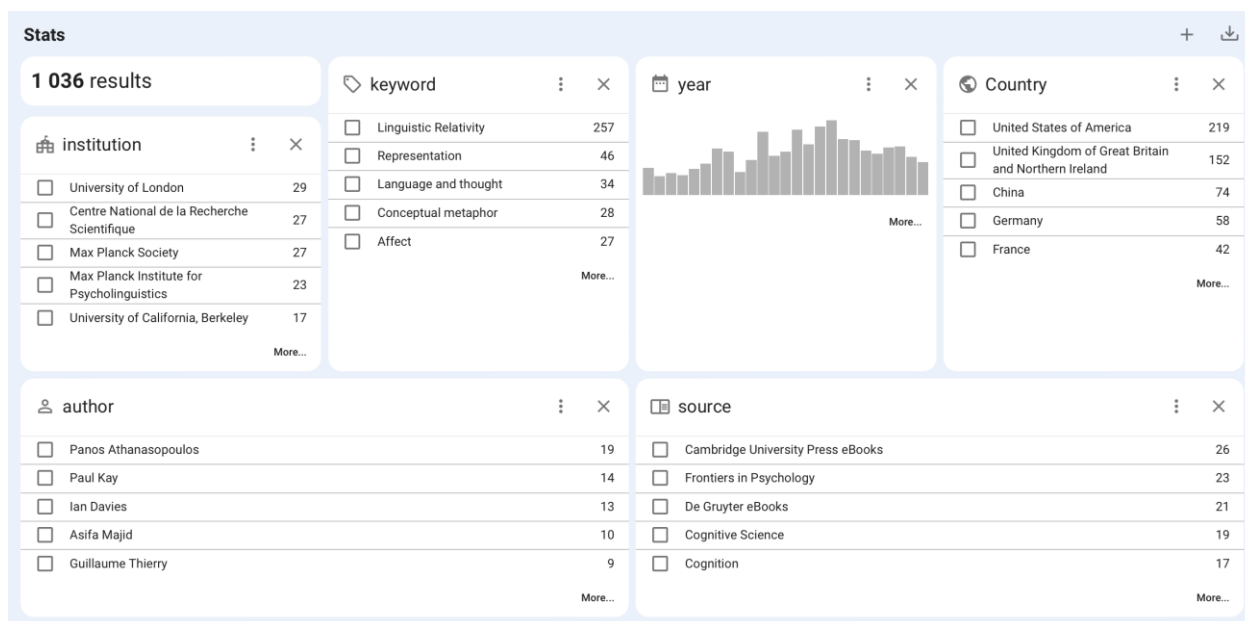
3.1. Эффективность исследуемой области

Датасет, созданный для библиометрического анализа, включает в себя 1029 источников, авторами которых стали около 1000 исследователей, опубликованных в более чем 800 изданиях. Тематика изданий имеет отношение преимущественно к областям психолингвистики и когнитивной лингвистики (Рисунок 2). На Рисунке 2 представлены общие статистические данные по исследуемому датасету из 1036 исследований, предлагаемых программой OpenAlex до исключения 7 источников на

этапе выгрузки в VOSviewer, о котором шла речь выше. Большая часть источников датасета представлена статьями в журналах (85%), главами в коллективных монографиях (12%), монографиями (порядка 3%).

Наиболее продуктивными авторами предметной области за указанный период являются Panos Athanasopoulos (19 публикаций), Paul Kay (14), Ian Davies (13), Asifa Majid (10), Guillaume Thierry, Mutsumi Imai (по 9 публикаций), Luna Filipović (8), Teresa Cadierno, Jordan Zlatev (по 7). Что касается географической локализации исследований, то наибольшее количество исследований приходится на США (219 исследований из 1029), Великобританию (152), Китай (74), Германию (58), Францию (42), Нидерланды (37). Россия представлена всего 13 исследованиями, что может свидетельствовать о недостаточной разработанности данного предметного поля в отечественной лингвистике.

Рисунок 2. Статистика по метаданным авторского датасета, созданная системой OpenAlex
Figure 2. OpenAlex author's dataset metadata statistics



Динамика публикационной активности, как показано на Рисунке 2, с начала исследуемого периода имеет

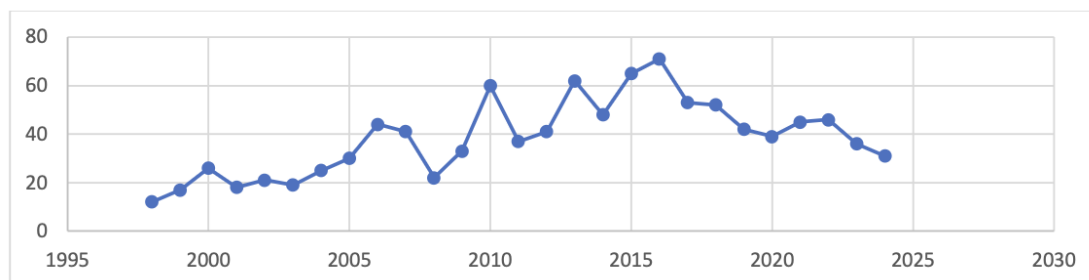
прирост, особенно до 2016 года, на который приходится пик активности. Количество публикаций в 2016 г.

составило 71, в 2024 г. – 29. После 2016 г. наблюдается незначительный спад

интереса к исследуемой проблематике (Рисунок 3).

Рисунок 3. Распределение количества публикаций по годам (с 1998 по 2024 г.)

Figure 3. Distribution of publications number by year (from 1998 to 2024)

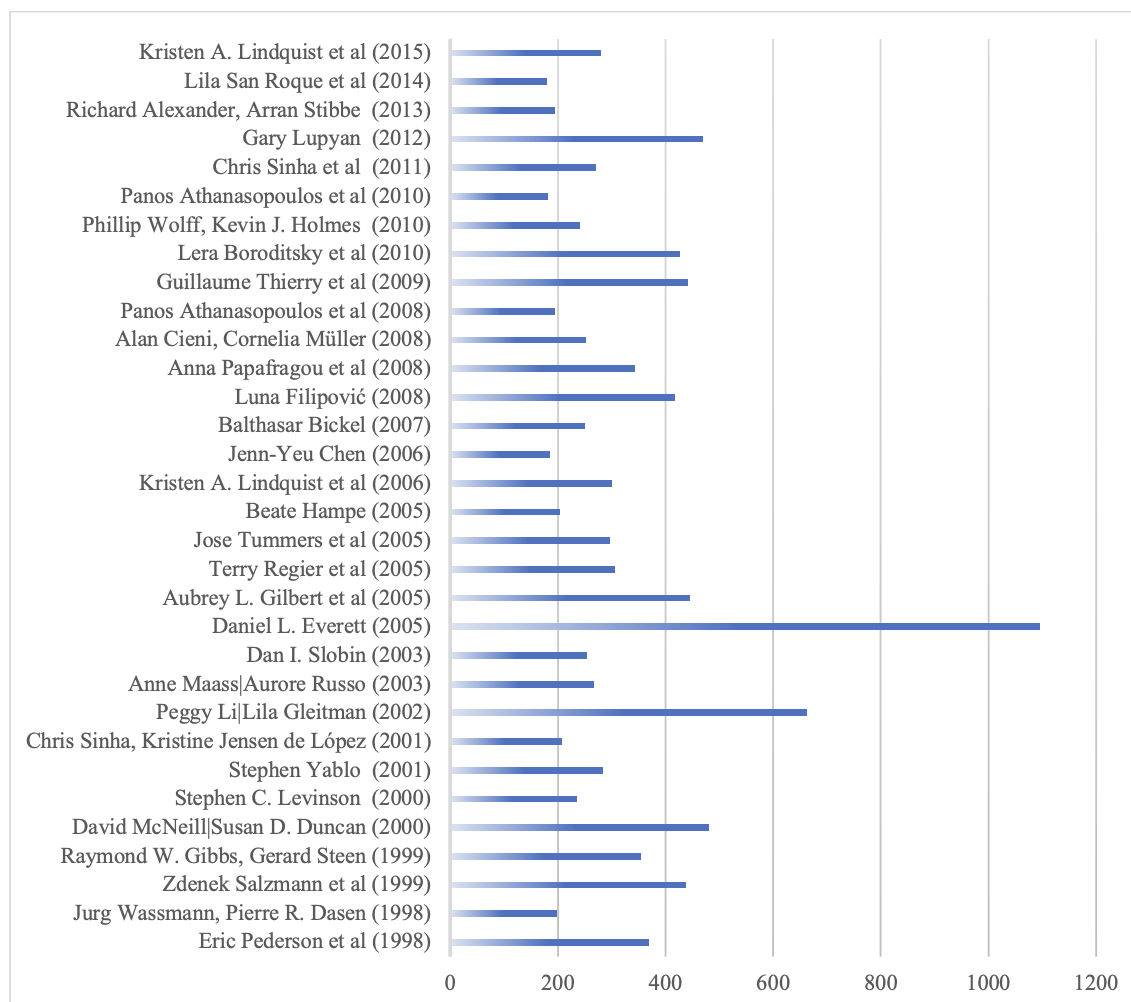


Среди научно-исследовательских центров лидерами в области являются Лондонский университет, Национальный научно-исследовательский центр во Франции и Институт Макса Планка в Лейпциге.

Рейтинг цитируемости статей представлен на Рисунке 4. Самыми цитируемыми оказались работы «*Cultural Constraints on Grammar and Cognition in*

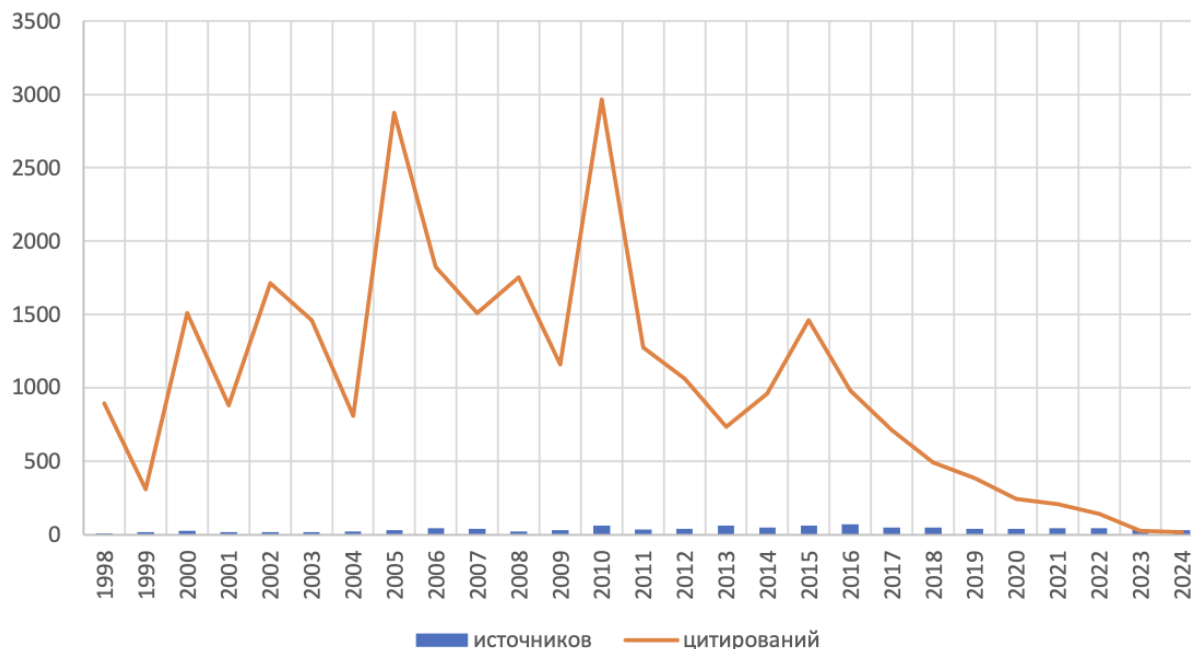
Pirahã Another Look at the Design Features of Human Language» (Everett, 2005) – 1096 цитирований, «*Turning the tables: language and spatial reasoning*» (Li, Gleitman, 2002) – 663 цитирования, «*Growth Points in Thinking-for-Speaking*» (McNeill, Duncan 2000) – 481 цитирование, «*Linguistically modulated perception and cognition: the label-feedback hypothesis*» (Lupyan 2012) и другие.

Рисунок 4. Топ 30 самых цитируемых статей в исследуемом поле
Figure 4. Top 30 most cited articles in the field



Динамика цитируемости в Рисунок 5. Пики цитируемости приходятся на 2005 и 2010 гг.

Рисунок 5. Динамика цитируемости по годам по отношению к числу публикаций
Figure 5. Dynamics of citations by year in relation to the number of publications



Начиная с 2016 года наблюдается резкое снижение интереса к исследуемой проблематике, что может свидетельствовать о трансформации исследовательского поля и необходимости глубокого качественного анализа его содержания.

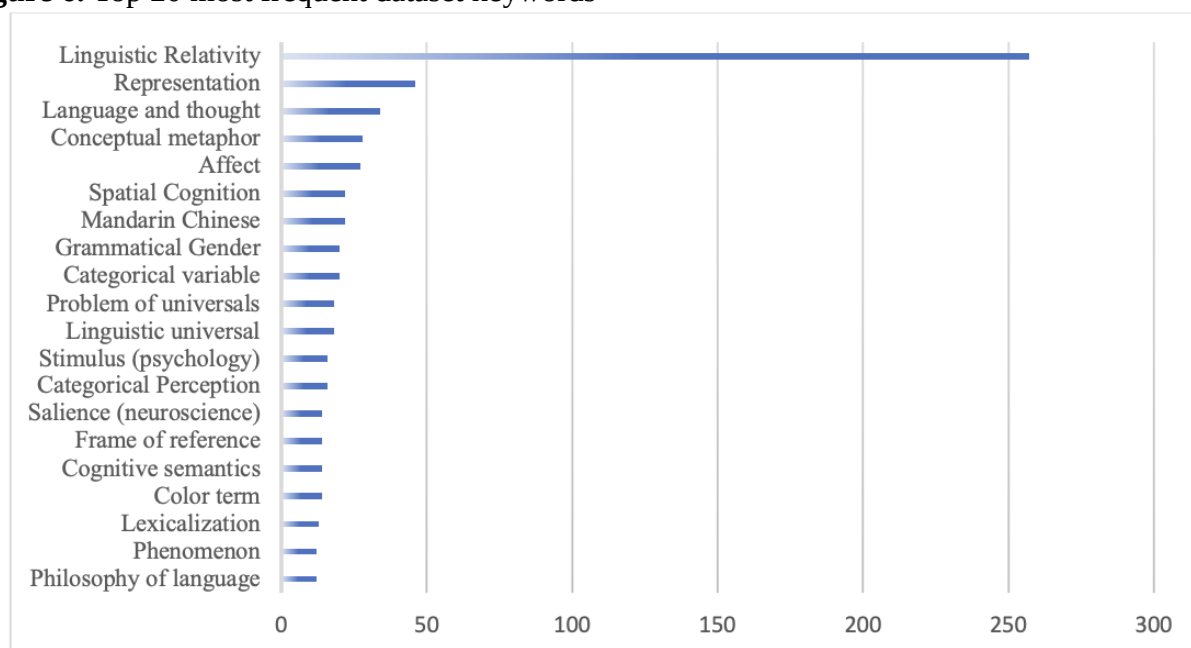
3.2. Анализ понятийной сети исследуемого поля

Одним из наиболее эффективных методов для картирования предметной области является анализ ключевых слов и может использоваться как для выявления пробелов внутри области, так и для обнаружения наиболее перспективных направлений. В анализируемом датасете

алгоритмы OpenAlex выделяют ряд ключевых слов, таких как *Linguistic Relativity* (257), *Representation* (46), *Language and thought* (34), *Conceptual metaphor* (28), *Affect* (27), *Spatial Cognition* (22) и др. Перечень самых частотных слов датасета представлен на Рисунке 6. Частотность ключевых слов в настоящем исследовании представлена, скорее для иллюстрации, чем для интерпретации, в силу описанных выше алгоритмических особенностей OpenAlex. В связи с этим, основные выводы в работы будут сделаны не на основе ранжирования слов по частотности, но на основе картирования кластерной структуры и динамики поля в целом.

Рисунок 6. Топ 20 наиболее частотных ключевых слов датасета

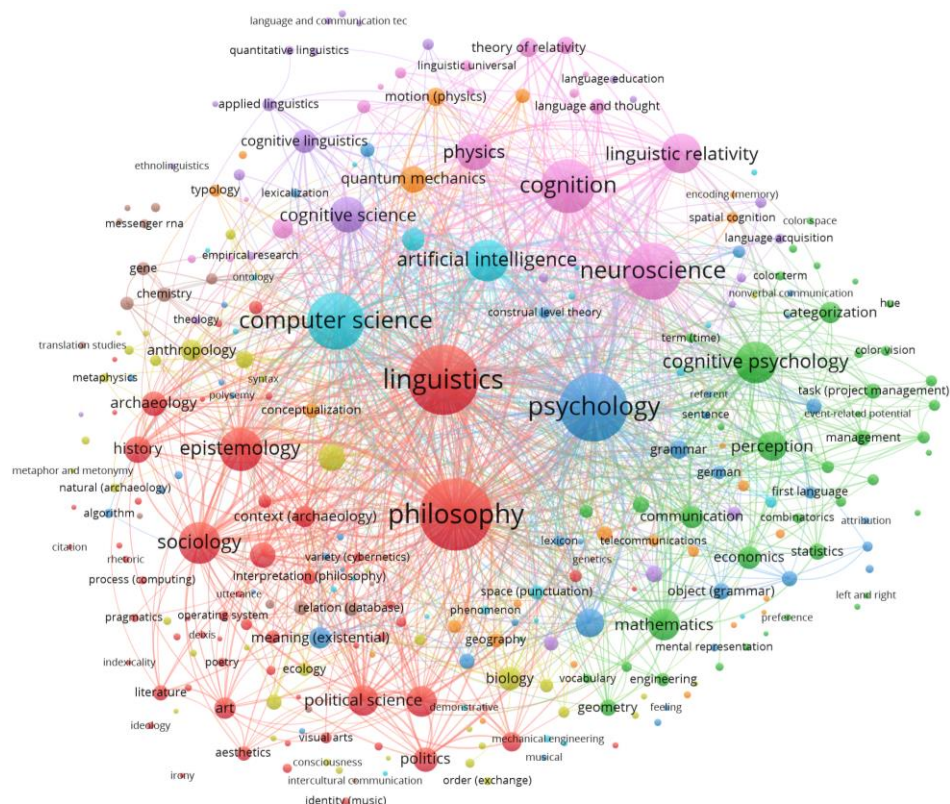
Figure 6. Top 20 most frequent dataset keywords



Для визуализации понятийной сети, по методу совместной встречаемости датасет был загружен в приложение VOSviewer. Минимальное число совместной встречаемости ключевых слов было установлено на отметке 5. Такому параметру отвечали 285 единиц. Результат визуализации представлен на Рисунке 7. Все ключевые слова, указанные в исследованиях и встречающиеся совместно с ключевым словом «лингвистическая относительность», были распределены системой по 9 кластерам (минимальный размер кластера 10 единиц), которые оказались тесно

переплетены между собой. Размер сферы на рисунке показывает количество связей. Чем больше сфера, тем чаще ключевое слово, обозначенное этой сферой, встречалось с другими ключевыми словами. Рисунок 7 показывает, что областями, в которых в большей степени обсуждается понятие лингвистической относительности являются: лингвистика, философия, психология, эпистемология, социология, компьютерные науки и искусственный интеллект, нейронауки, когнитивные науки, и, в значительной степени, когнитивная психология.

Рисунок 7. Сеть совместной встречаемости ключевых слов по методу LiLog Modularity
Figure 7. The keywords co-occurrence network using the LiLog Modularity method

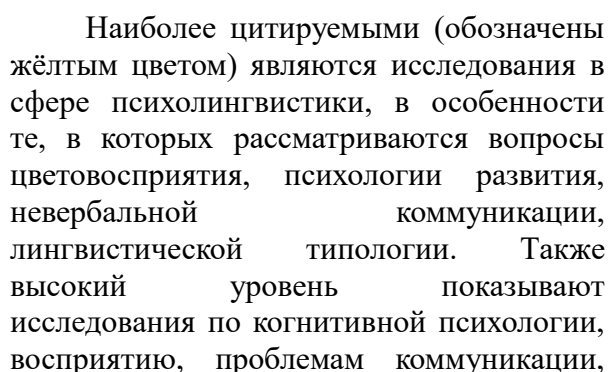


Кластер 1 (красный цвет) является самым многочисленным, насчитывает 58 единиц, объединяет в себе исследования в области философии, лингвистики, лингвистической антропологии, семиотики, концептуальной метафоры, поэзии, политических наук, искусства, археологии. **Кластер 2** (зелёный) представлен 42 единицами и соотносится с областью когнитивной психологии, изучающей проблемы перцепции, категоризации, исследования в области цвета, а также машинного обучения. **Кластер 3** (синий) включает 40 единиц, репрезентирующих предметное поле психологии, психолингвистики, вопросы языковой способности, мультилингвизма, ментального лексикона, невербальной коммуникации. **Кластер 4** (жёлтый) содержит 36 единиц, которые максимально разбросаны по семантической карте. Данный кластер можно обозначить как

кластер философии сознания, поскольку он объединяет такие ключевые слова как биология, эволюционная биология, экология, антропология, сознание, сенсорные системы, синтаксис, метафора, метонимия, философия науки, сознания и языка. **Кластер 5** (фиолетовый) насчитывает 25 ключевых слов характерных для исследований в области когнитивной и прикладной лингвистики, фокусирующихся на проблемах когнитивной грамматики, функциональной и сопоставительной лингвистики, обучения родному и иностранным языкам, медиалингвистики и этнолингвистики. **Кластер 6** (голубой) включает 24 единицы, соотносящиеся с областью информационных технологий, искусственного интеллекта, обработки естественного языка. **Кластер 7** (оранжевый) по количеству включений сопоставим с предыдущим и связан с

Кластер 9 (розовый), в котором ключевым (по весу) является понятие лингвистической относительности, объединяет некоторые проблемы теории относительности (в физике) с проблемами языка, мышления, языковых универсалий и дескрипций, познания и нейронауки.

Рисунок 8. Среднее число цитирований по методу LiLog Modularity
Figure 8. Citations average number using LiLog Modularity method



нейроисследования многоязычия, взаимосвязи пространства и познания, грамматике, концептуализации и усвоению концептов. При этом наиболее частотные ключевые слова, такие как лингвистика, философия, психология, компьютерные науки, а также лингвистическая относительность находятся в средней зоне (ближе к более низким показателям) цитирования.

Обсуждение

На основе полученных результатов можно составить представление о состоянии складывающейся пострелятивистской парадигмы. В исследуемом датасете ключевое слово «репрезентация» является вторым по частотности после «лингвистической относительности». Данное понятие является дискуссионным, поскольку в различных отраслях когнитивной науки определяется с позиций различных теорий. Существует целый ряд теорий, рассматривающих понятие семантических репрезентаций, среди которых есть полностью амодальные, умеренно-модальные, умеренно-телесные и полностью телесные теории (Бородай, 2020: 463). Так, например, в теории перцептивных символов Л. Барсалоу (Barsalou et al., 2008), которая относится к последним, репрезентация понимается как определённое зафиксированное сенсомоторное состояние. Другие ключевые слова, такие как «язык и мышление», «концептуальная метафора», «пространственное познание» и др. позволяют выстроить понятийное поле, коррелирующее с основными пунктами программы пострелятивистских исследований.

Проведённый библиометрический анализ, на основе 1029 источников, метаданные которых были проанализированы по годам, частотности ключевых слов, совместной встречаемости и количеству цитирований, позволил выявить наиболее значимые сферы научного знания, в которых происходит обсуждение понятия лингвистическая относительность и обнаружить тенденции его развития.

С момента выхода в 1996 году знаковой работы «*The Whorf Theory Complex. A Critical Reconstruction*» (Lee, 1996), имеющей на сегодняшний день 179 цитирований в базе данных Semantic Scholar и 541 цитирование в Google Scholar, было опубликовано значительное

количество работ, разрабатывающих положения принципа лингвистической относительности в различных областях знаний. Однако в настоящее время наблюдается некоторый спад интереса к понятию «лингвистическая относительность» как с точки зрения публикационной активности – максимальное количество исследований было опубликовано в 2016 году, – так и с точки зрения цитирования работ по данной тематике – пик цитирований приходился на 2005 и 2010 годы. Подобная динамика может, с одной стороны, свидетельствовать о возможном насыщении или стагнации в рамках сложившихся подходов и, с некоторых позиций, интерпретироваться как кризисное явление. С другой стороны, спад публикационной активности по ключевым словам «лингвистическая относительность» может быть вызван интеграцией проблематики в другие, более широкие предметные области, в которых данный термин не маркируется; смещением фокуса на смежные области; или отсутствием комплексной методологии для изучения лингвистических явлений в русле пострелятивистской парадигмы. Таким образом, стоит рассматривать полученные данные не как безусловное доказательство кризиса парадигмы, но как индикатор трансформации исследовательского поля, требующий дальнейшего качественного анализа.

Вместе с тем, полученные результаты позволили выделить ряд областей и сфер знания, характеризующихся интересом к исследуемому понятию, а также сопоставить их (см. Таблицу 1) с пунктами пострелятивистской исследовательской программы С.Ю. Бородая (Бородай, 2019; 2023), в которой роль языка в когнитивной архитектуре видится лингвоспецифичной и культуроспецифичной. Данное сопоставление является собой аналитическую интерпретацию, призванную продемонстрировать какие из заявленных областей находят отражение в понятийной сети, построенной в ходе

анализа библиометрических данных. Такая интерпретация может рассматриваться как эвристический приём для выявления зон потенциального пересечения и

расхождения между теоретической программой и состоянием поля, в той его части, которая представлена в OpenAlex.

Таблица 1. Сопоставительный анализ областей исследовательской программы и связей понятия лингвистическая относительность согласно данным библиографического анализа
Table 1. Comparative analysis of areas within the research programme and connections between the concept of linguistic relativity, based on bibliographic analysis data.

Научная область	Пострелятивистская исследовательская программа	Библиометрический анализ (научная база OpenAlex)
лингвистическая антропология	+	-
лингвистическая типология	+	-
когнитивная лингвистика	+	+
симуляционная семантика (нейронауки)	+	+
психология развития	+	+
теория воплощенного познания	+	-
социальные науки	+	+
этнографические исследования	+	+
топологические исследования	+	-
темпоральные исследования	+	-

Как видно из Таблицы 1, из 10 заявленных в программе областей в той или иной степени представленными в понятийной сети, построенной OpenAlex, оказываются лишь 50%. Необходимо отметить, что отсутствие таких научных областей как «лингвистическая типология» или «теория воплощённого познания» в данной сети не означает отсутствия исследований как таковых, но может быть следствием терминологических различий (исследователи могут не использовать термин «лингвистическая относительность») или особенностей алгоритмов кластеризации OpenAlex, при

включении таких работ в датасет. Таким образом, выявленные «белые пятна» следует рассматривать не как однозначное свидетельство недостаточной разработанности темы, а как перспективу для дальнейшего междисциплинарного диалога.

Значительную проработку понятие «лингвистическая относительность» получило в таких научных областях как лингвистика, философия, психология, когнитивные науки, нейронауки, компьютерные науки и искусственный интеллект, антропология, физика, биология и некоторые другие (см. Рисунок 9).

характеризуются такие исследователи как П. Атанасопулос, П. Кей, и Я. Дэвис, в то время как работа Д. Эверетта является наиболее цитируемой. Наиболее значимыми площадками для публикации и продвижения идей этой парадигмы являются журналы *Frontiers in Psychology*, *Cognitive Science* и *Cognition*. Анализ понятийной сети позволил сделать вывод о том, что ядро исследований составляют когнитивная лингвистика, психолингвистика, когнитивная психология и нейронауки, в которых активно разрабатываются проблемы репрезентации знаний, концептуальной метафоры и пространственной ориентации.

Анализ эффективности исследований предметного поля позволил выявить тенденции заметного спада после пика развития, пришедшегося на 2005-2015 гг. Эта тенденция может интерпретироваться как возможная трансформация исследовательского ландшафта (интеграция проблематики в смежные области, обновление терминологии), требующая дальнейшего качественного изучения.

Ответ на второй вопрос касается междисциплинарности пострелятивизма. Тезис о междисциплинарном характере парадигмы подтверждается частично: понятие лингвистической относительности широко представлено в философии языка, психолингвистике, компьютерных науках и науках об искусственном интеллекте. Однако сопоставление данных библиометрического анализа с пунктами пострелятивистской исследовательской программы С.Ю. Борода выявило ряд несоответствий. Такие ключевые для пострелятивизма области как лингвистическая типология, лингвистическая антропология и теория воплощённого познания, в настоящее время остаются на периферии понятийной сети. Этот результат, однако, может отражать не столько отсутствие

исследований как таковых, сколько наличие терминологических сдвигов или характер алгоритмической кластеризации OpenAlex.

В отношении третьего вопроса идентифицированы перспективные направления и «белые пятна». Наименее разработанными в массиве данных оказались топологические и темпоральные исследования, а также исследования выполненные в русле теории воплощённого познания. Заполнение данных пробелов, особенно на материале малых и экзотических языков, способно укрепить статус пострелятивизма как целостной программы и расширить его эмпирическую базу, заставить по-новому взглянуть на взаимосвязь языка, культуры и мышления. Таким образом, настоящее исследование не только описывает текущее состояние парадигмы, но и определяет фронтиры ее роста.

Вместе с тем исследование имеет ряд ограничений. Несмотря на то, что научная база OpenAlex является одной из самых больших и насчитывает порядка 150 млн. публикаций, не все публикации по данной тематике могли быть в неё включены. Для получения более полной и объективной картины состояния пострелятивистской парадигмы в современной лингвистике необходимо привлечение других научных баз данных (Scopus, Web of Science, Dimensions, Elibrary, China National Knowledge Infrastructure). Алгоритмический характер тематических меток OpenAlex накладывает существенные ограничения на структуру понятийной сети. Также невозможным представляется выявление узкой специфики проблем и направлений, рассматриваемых в предметном поле при помощи библиометрического анализа. Такие вопросы требуют глубокого качественного исследования содержания материалов датасета, использованного в настоящей работе (а также в перспективе собранных в других базах).

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Ольга Владимировна Глухова, кандидат филологических наук, доцент, доцент кафедры лингвистики и межкультурной коммуникации, заместитель декана по научно-исследовательской работе факультета лингвистики и журналистики, Ростовский государственный экономический университет (РИНХ), Ростов-на-Дону, Россия.

Olga V. Glukhova, PhD in Philology, Associate Professor, Department of Linguistics and Intercultural Communications, Deputy-dean of the Faculty of Linguistics and Journalism, Rostov State University of Economics (RINH), Rostov-on-Don, Russia.

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Daria D. Guseva¹ 

Olga A. Mitrofanova² 

**Automatic keyphrase extraction and annotation:
modern theoretical approaches and practical solutions
for text and speech**

¹ Saint-Petersburg State University,
7/9 Universitetskaya Embankment, Saint Petersburg, 199034, Russia
E-mail: daria.guseva@spbu.ru
ORCID: 0009-0005-1753-9904

² Saint-Petersburg State University,
7/9 Universitetskaya Embankment, Saint Petersburg, 199034, Russia
E-mail: o.mitrofanova@spbu.ru
ORCID: 0000-0002-3008-5514

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Abstract: The exponential growth of textual and audiovisual information has made the task of automatic keyphrase extraction (KE) increasingly significant. This article provides a comprehensive analysis of contemporary theoretical approaches and practical solutions for KE across both text and speech modalities. The primary contribution of this work is its systematic synthesis of these often-disparate research strands into a unified analytical framework, highlighting the evolution of the field from statistical methods towards large language models (LLMs) and end-to-end speech processing. We examine the stages of KE, the characteristics of keyphrases in written and spoken language, and terminological nuances. Various methods for automatic KE are discussed and analyzed in detail: statistical, hybrid, machine learning-based, and structural. The review dedicates substantial attention to emerging paradigms, including keyphrase generation using LLMs, and provides a detailed overview of methodologies and challenges in automatic corpus annotation. Furthermore, we specifically analyze current directions and inherent difficulties in KE for spoken language, comparing transcript-based and end-to-end acoustic approaches. This synthesis leads us to conclude that the field is moving towards a more integrated, context-aware paradigm. Future progress will depend on addressing key challenges such as data scarcity for low-resource languages, effective multimodal fusion, and the nuanced evaluation of generative KE systems.

Keywords: Automatic keyphrase extraction; Spoken language processing; Speech summarization; Automatic annotation; Computational linguistics; Corpus linguistics

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Гусева Д. Д.¹ 

Митрофанова О. А.² 

**Автоматическое выделение ключевых выражений
и аннотирование: современные теоретические подходы
и практические решения для работы с текстом и речью**

¹ Санкт-Петербургский государственный университет
Университетская набережная, 7/9, Санкт-Петербург, 199034, Россия
E-mail: daria.guseva@spbu.ru
ORCID: 0009-0005-1753-9904

² Санкт-Петербургский государственный университет
Университетская набережная, 7/9, Санкт-Петербург, 199034, Россия
E-mail: o.mitrofanova@spbu.ru
ORCID: 0000-0002-3008-5514

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Аннотация: Экспоненциальный рост объемов текстовой и аудиовизуальной информации значительно повышает значимость задачи автоматического выделения ключевых выражений. В данной статье представлен всесторонний анализ современных теоретических подходов и практических решений для автоматического выделения ключевых выражений как в текстовой, так и в речевой модальностях. Основной вклад работы заключается в систематическом синтезе этих зачастую разрозненных направлений исследований в рамках единой аналитической структуры, демонстрирующей эволюцию области от статистических методов к большим языковым моделям и сквозной обработке речи. Мы рассматриваем этапы автоматического выделения ключевых выражений, характеристики ключевых выражений в письменной и устной речи, а также терминологические нюансы. Подробно обсуждаются и анализируются различные методы автоматического выделения ключевых выражений: статистические, гибридные, основанные на машинном обучении и структурные. В обзоре значительное внимание уделено новым парадигмам, включая генерацию ключевых выражений с использованием больших языковых моделей, а также представлен детальный обзор методологий и проблем автоматической аннотации корпусов. Кроме того, мы анализируем текущие направления и трудности, присущие задаче автоматического выделения ключевых выражений из устной речи, и сравниваем подходы, основанные на расшифровке и сквозном акустическом анализе. Этот синтез позволяет сделать вывод о переходе области к более интегрированной, контекстно-ориентированной парадигме. Дальнейший прогресс будет зависеть от решения ключевых задач, таких как нехватка данных для малоресурсных языков, эффективное мультимодальное объединение и тонкая оценка генеративных систем автоматического выделения ключевых выражений.

Ключевые слова: Автоматическое выделение ключевых выражений; Обработка устной речи; Суммаризация речи; Автоматическое аннотирование; Компьютерная лингвистика; Корпусная лингвистика

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1. Introduction

The task of automatic keyphrase extraction (KE) is gaining increasing relevance amidst the exponential growth in both textual and audiovisual information. Effective keyphrase extraction methods enable the structuring and analysis of large volumes of data, automating processes of search, classification, and summarization. This has broad applications across various fields, including computational and cognitive linguistics, psycholinguistics, philology, communication theory, computer science, economics, and more. The selection of extraction methods, in this context, is considered a complex and debated issue. Within the domain of text linguistics, this task is regarded as one of the most challenging (Papusha, 2008). Areas where KE is essential include natural language processing, information retrieval, machine learning (ML) and artificial intelligence (AI), education, databases, marketing and advertising, business analytics, translation, and social media analysis.

The significance of this field is further evidenced by the substantial and growing body of research. A search of the Dimensions¹ engine reveals 24,338 publications on keyphrase processing and applications over

the past 50 years (see Fig. 1). The number of papers devoted to keyphrase extraction, assignment, search, etc. has increased exponentially since the 2000s, reaching a maximum of 1137 items in 2023. Distribution of research papers over fields of knowledge indicates the dominance of three domains: Biomedical and Clinical Sciences (12,485 papers), Information and Computing Sciences (9,836 papers), Language, Communication and Culture (974 papers), cf. Figure 2.

VOS Viewer data visualization² allows users to navigate in co-authorship and citation networks. For top 500 researchers we registered 531 co-authorship links in 2739 total co-authorships distributed over 200 clusters, cf. Fig. 3. VOS Viewer indicates high citation density and allows to point cross-reference network with fundamental publications on the topic at its core, cf. Fig. 4. For top 500 researchers the network includes 8994 citation links, 17593 total citations distributed over 52 clusters. However, the problems of keyword annotation and spoken text processing are not sufficiently covered in publications, so links to them are not included in the top results of scientometric tools. Our work aims to restore the interest of the academic community in these aspects.

¹ Available at: <https://www.dimensions.ai/> (Accessed 22.11.2025)

² Available at: <https://app.vosviewer.com/> (Accessed 22.11.2025)

Figure 1. Publication activity: papers on keyphrase analysis and processing via Dimensions over 50 years

Рисунок 1. Публикационная активность: статьи по анализу и обработке ключевых выражений в Dimensions за последние 50 лет

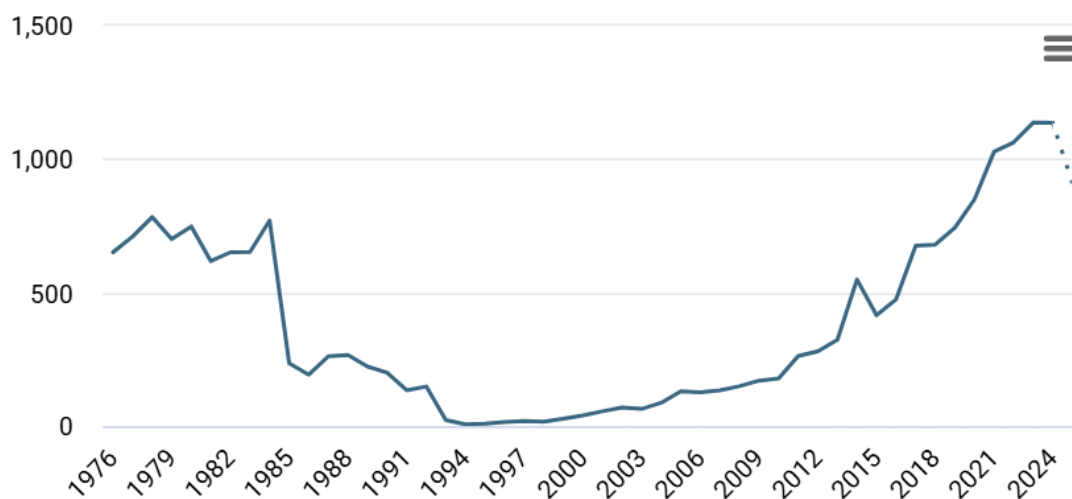
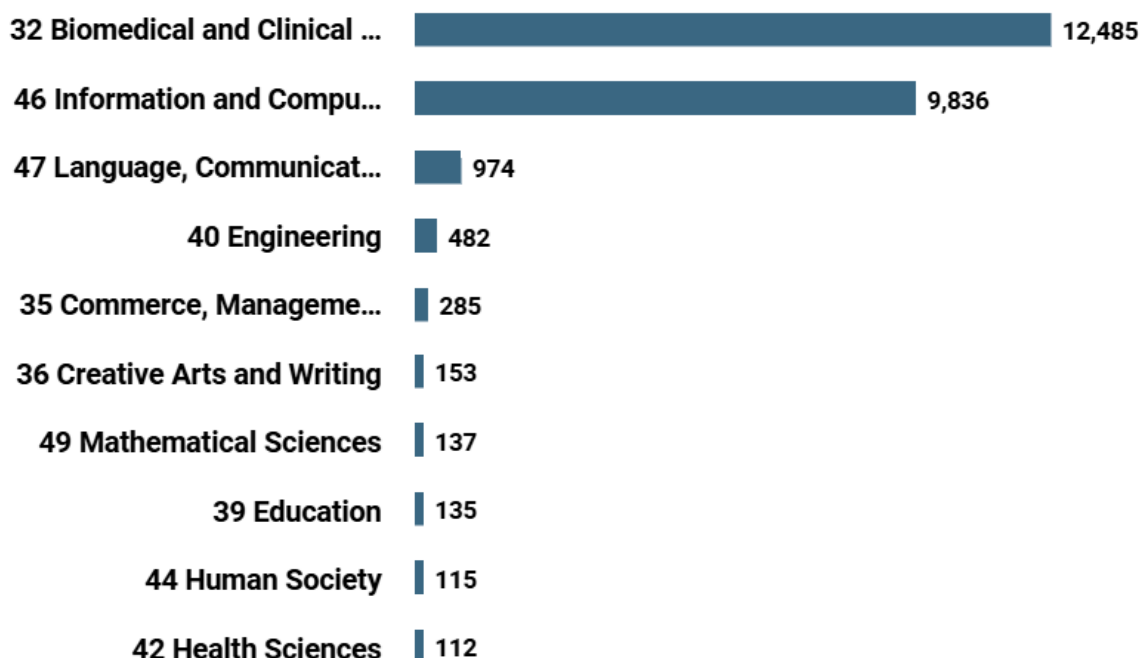
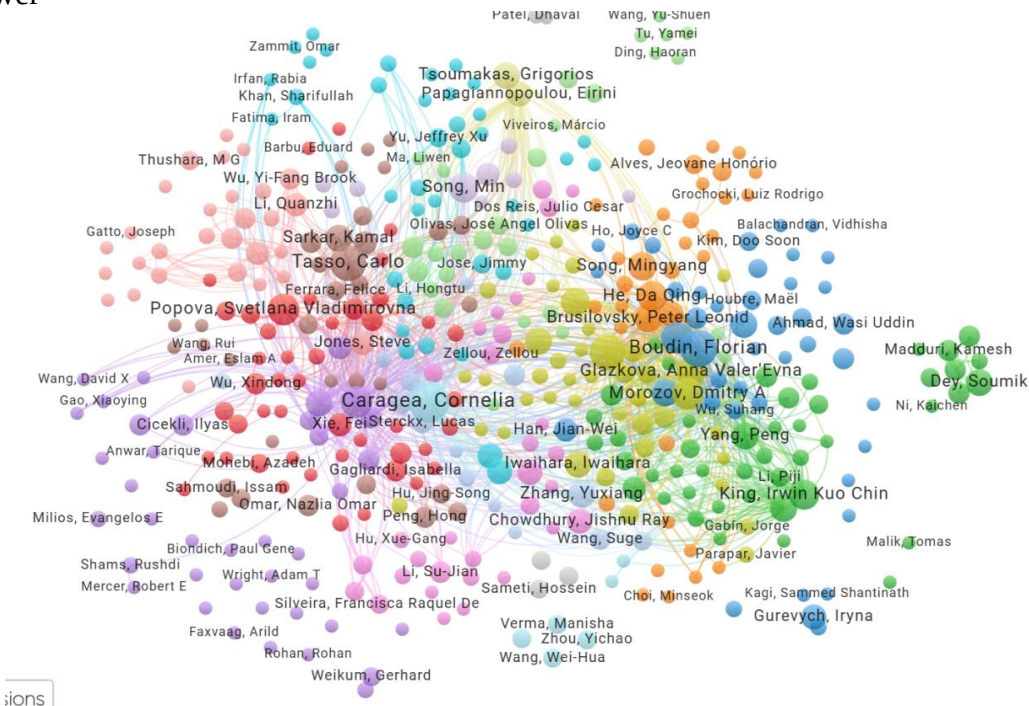
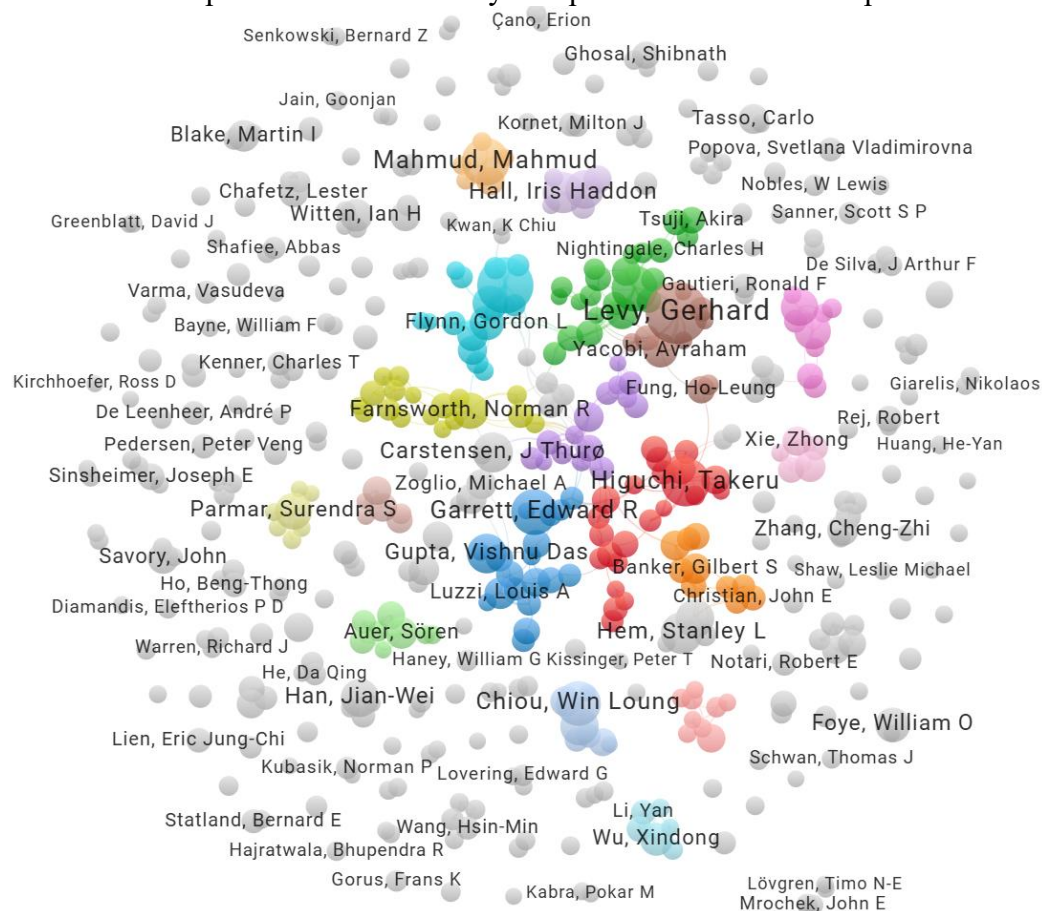


Figure 2. Distribution of research papers on keyphrase analysis and processing over fields of knowledge (top 10 domains)

Рисунок 2. Распределение научных работ по анализу и обработке ключевых выражений по областям знаний (топ-10 областей)





Different scientific disciplines exhibit significant divergences in their approaches to studying and defining keyphrases. For instance, information retrieval focuses on the practical application of keyphrases for information extraction, while psycholinguistics concentrates on their cognitive and linguistic properties. The issue of approach unification is even proposed to be addressed through musicological analysis, based on common patterns in the semantic structure of poetic texts and musical compositions (Antipina and Prokhorenkova, 2020). The multiplicity of approaches leads to variations in terminology and methodology.

This article examines contemporary theoretical approaches and practical solutions for the task of automatic keyphrase extraction. Within this review, we analyze the stages of automatic KE, the features characterizing them in written and spoken language, and the terminological specifics that have emerged across different scientific domains. We also discuss various methods of automatic KE, including statistical, hybrid, machine learning-based, and structural approaches, and analyze their advantages and limitations. Particular attention is paid to the specifics of KEs in spoken language, including their acoustic characteristics and their impact on perception, as the extraction of these units from speech presents unique challenges and remains significantly underexplored compared to written text analysis. Furthermore, an overview of current trends in automatic KE from spoken language is presented, encompassing the use of deep learning methods and automatic annotation. The analysis of these methods will allow us to evaluate the effectiveness of different approaches and identify promising directions for future research.

This study is framed by the following research questions aimed at advancing our understanding of keyphrase extraction:

RQ1: How do different research disciplines (information retrieval, psycholinguistics, speech processing, etc.)

define and operationalize keyphrases in their methodologies?

RQ2: How do these methodologies contribute to keyphrase extraction procedures across disciplines?

RQ3: What opportunities arise from combining psycholinguistic theories with information retrieval metrics for improved keyphrase extraction?

RQ4: What are limitations of current automatic keyphrase extraction methods as regards text genres, domains, written or spoken texts?

RQ5: What are the most significant language-specific challenges in keyphrase processing?

RQ6: How LLMs may improve automatic keyphrase extraction and generation?

RQ7: What are the perspectives of integration of multimodal information into keyphrase processing?

Our review is based on the following methodological principles: in choosing theoretical foundations, we focus on those approaches that have been implemented or are applicable to Russian-language data; in choosing datasets, corpora and models we take into account their accessibility to the scientific community, in choosing technical solutions we consider their scalability and reproducibility.

2. Theoretical foundations of keyphrase extraction

2.1. Terminology and Definitions

The terms “keyphrase,” (“ключевое выражение/словосочетание”) and “keyword,” (“ключевое слово”) can often be used synonymously in most studies, including those mentioned in the next paragraph. In this context, “keyword” frequently refers to both single words and multi-word expressions, driven by the necessity of using collocations rather than isolated words for a more accurate and precise reflection of content (Bolshakova et al., 2011).

Additionally, the Russian-language literature includes terms such as “ключевые термины” (“key terms”) (Grineva and

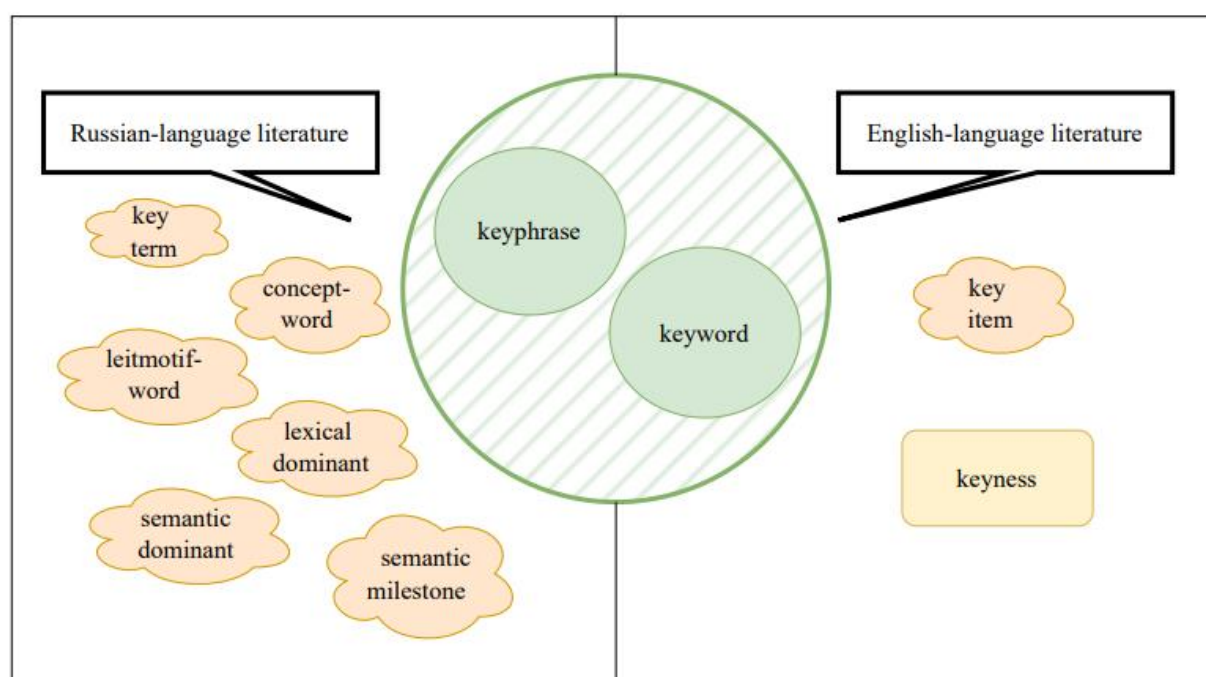
Grinev, 2009), “слова-концепты” (“concept-words”), “слова-лейтмотивы” (“leitmotif-words”) (Svetozarova and Shtern, 1989), “лексические доминанты” (“lexical dominants”), “семантические доминанты” (“semantic dominants”), and “смысловые вехи” (“semantic milestones”) (Shekhtman, 2005). In English-language literature, “keyword,” “keyphrase,” and “key item” are used (Wilson, 2013). The concept of “keyness” is also employed in English

literature, referring to a statistical measure that reflects the most content-rich words in a text. Its analysis is used to identify elements that occur statistically significantly more or less frequently in one corpus compared to another, and can focus on differences (keyness-D) or similarities (keyness-S) between corpora (Kilgariff, 2009; Gabrielatos, 2018; Evert, 2022).

The variety of terminology used to identify keyphrases is illustrated in Figure 5.

Figure 5. Terminological landscape of keyphrases

Рисунок 5. Терминологическое разнообразие для обозначения ключевых выражений



In this work, we will use the term “keyphrase,” which, in our view, leads to fewer ambiguities. When citing the work of other researchers, their original terminology may be preserved.

We proceed to an examination of the core definitions of keyphrases presented in the Russian-language domain literature. In text perception studies, a psycholinguistic approach is often adopted, where a set of keywords is considered a condensed version of the original, expanded text (“текст-примитив”), possessing wholeness and coherence (Sakharny and Shtern, 1988). Keywords convey the text’s theme, and their

ordering reflects the rheme (Sakharny, 1982). It is believed that any written or spoken text can be compressed into a set of keywords. Consequently, the content structure, defined by the distribution of keyphrases within a text, can be described as semantically significant, as it enables one to understand the main meaning of the text. This is particularly important for text perception. Keyphrases extracted from a text form its linguistic image, which can be linearly expanded back to reconstruct the content of the compressed text.

The foundational research conducted by Sakharny and Shtern (1988) warrants

particular scholarly attention within the context of this review. Their seminal investigation remains highly relevant as a cornerstone for contemporary KE studies, and crucially, it constitutes one of the relatively few methodologies explicitly built upon the empirical analysis of keyphrases functioning within spoken discourse.

The work by Sakharny and Shtern (1988) presents a review of a series of experiments using various texts (fiction, scientific and technical, spontaneous dialogues, etc.), which were used to extract the keywords, reconstruct text from the sets of keywords, and reconstruct spoken text presented against a background of white noise. In the latter case, experiments were conducted both with and without prior familiarization of participants with the sets of keywords. The researchers investigated patterns of text compression into the sets of keywords, their structure, their connection to the original text's structure, and the influence of the keywords on the noise resistance of the original text. Typically, words from the initial part of the text are prioritized for the set of keywords, with further expansion occurring through refinement of the characteristics of the selected keyword(s). Nouns (in their base form) and/or noun-adjective combinations denoting the themes of text fragments often serve this role. From a syntactic perspective, a chain-like structure is characteristic of the set of keywords (where the preceding rheme becomes the theme in the subsequent fragment). Disruptions arise when the original text has a more complex structure. Experiments also demonstrated that prior familiarization of subjects with the set of keywords can improve the perception of the original text under both external and internal interference (white noise, poor language proficiency, missed words in the text). This confirms that keywords create contextual connections and associations that facilitate text comprehension, and the mechanism underlying improved perception after familiarization with the set of keywords is universal, operating for both Russian speakers

in noisy conditions and foreign learners of Russian.

In scientific texts, a set of keyphrases is defined as an invariant of content, reflecting the second stage of scientific text generation and perception (after the title, before the abstract and full text) (Kamshilova, 2013). Keyphrases are found at all these stages but with varying quantitative and substantive content, and they are typically present in strong positions within the text (first sentences and paragraphs).

Since keyphrases indicate "the subject area of knowledge, space, and time, equally understood by members of the same professional community, facilitating dialogue between them" (Moskvitina, 2009, p. 279), they can attract attention to texts, which aligns with the goals of information retrieval. In this context, the set of keyphrases includes the most significant units of a text and serves to form the search profile of documents (indexing), allowing for their concise characterization and retrieval (Jacquemin and Bourigault, 2003; Dostal, 2011). The applicability of keywords as descriptive metadata is universal, extending across diverse information objects, such as text, image, audio file, video file, and digital resources, disseminated online, thereby establishing their relevance for core information retrieval tasks (Abramov, 2011). Their use enhances search efficiency, creates compact indexes, improves ranking, and optimizes user queries. In a general sense, the approach to keyphrase extraction from an information retrieval perspective aims to create content that maximally matches user queries and increases website visibility in search results.

Internet texts are presented as HTML pages containing information about the website's content. Search engines index these pages, using keyphrase extraction to rank search results. Most information retrieval systems are based on a vector data model, where text is represented as a vector (set) of keyphrases. Search engines compare user query vectors with the vectors of indexed web

pages. Web pages containing keyphrases that match the query will have more similar vectors and, consequently, will be considered more relevant (Bolshakova et al., 2011).

Keyphrases are also defined as an “information portrait” of a topic, obtained as a result of searching for a specific query (Bolshakova et al., 2011). Their relevance and pertinence are determined by statistical and semantic algorithms. Evaluation criteria can include features such as the frequency of occurrence, density, and distribution of keyphrases within a document, as well as the use of semantic indexing algorithms (specifically, LSI, Latent Semantic Indexing), i.e., the presence of keyphrases semantically related to the target keyphrases. The final portrait can be presented, for example, as a “semantic map” or a table demonstrating search results (Bolshakova et al., 2011).

From the perspective of semantics, a branch of linguistics, keyphrases are defined as “семантические доминанты” (“semantic dominants”) (Shekhtman, 2005), which provide access to the hidden meaning of a text, i.e., they are considered in conjunction with the situational contexts they represent. With this approach, keyphrase types are identified at three levels of semantic structure organization: at the content level – “опорные слова” (“supporting words,”) at the meaning level – “смысловые вехи” (“semantic milestones,”) and at the intent level – (“слова-концепты”) (“concept-words.”) Based on this, it can be stated that keyphrases convey the meaning of a text at all levels of its comprehension (Moskvitina, 2009).

2.2. Features of Keyphrases

Traditionally, the primary features of keyphrases are considered to include their presence in high-frequency vocabulary; semantic coherence; and part-of-speech belonging to nouns, verbs, and adjectives (Vanyushkin and Grashchenko, 2016). However, the identification of these features is quite conventional. In reality, keyphrases are not always frequent, may not be semantically connected (e.g., in conversational text characterized by rapid

topic shifts), and can belong to other parts of speech.

The features characterizing keyphrases can also depend on the functional style of the text. For instance, in literary texts, pronouns are often identified as keyphrases (a prime example being the pronoun “я” (“I”) in texts narrated in the first person) (Svetozarova and Shtern, 1989).

For scientific texts, the following features are important (Moskvitina, 2009).

- High frequency. The occurrence frequency within the studied text is higher than in the language in general.
- Semantic proximity to the text’s theme. Connection to the text’s meaning, e.g., synonymy, hyponymic/hypernymic relationships.
- Informational density. Maximum amount of information with minimal volume; consequently, terms often function as keyphrases in scientific texts.

Synthesizing the various interpretations proposed by researchers (e.g., the previously mentioned Svetozarova and Shtern, 1989; Shekhtman, 2005; Moskvitina, 2009), it can be concluded that generally keyphrases inherently possess a set of common features, which typically encompass the following.

- Significance for text comprehension.
- Semantic integrity (cohesion/wholeness).
- Mutual intelligibility across a broad readership (or professional community).
- Conciseness and the capacity to represent substantial volumes of information compactly.

The aforementioned attributes are relevant to both written and spoken textual modalities.

2.3. Specific Features of Keyphrases in Spoken Text

Keyphrases in spoken text can possess all the features they exhibit in written text, but with the addition of several peculiarities related to the production and perception of spoken language. Consequently, in spoken text, keyphrases are characterized by

“prosodic specificity” (“просодическая специфичность”) (Yagunova, 2004). Significant features of keywords in spoken text include phonetic attributes such as their position within a syntagma and the presence of a pause before and after the word.

Research findings (Yagunova, 2004) indicate that keywords are 40% more likely to occur at the end of a syntagma than other text components. The probability of a pause before other words is 70% higher than before keywords. Concurrently, the probability of a pause occurring after a keyword is 1.5 times greater than the probability of it occurring after other words, and almost twice as great for pauses exceeding 750 ms (a duration corresponding to the end of a sentence). An experiment was also conducted with 8 participants whose task was to reconstruct a text after listening with interference (under white noise conditions). Participants recognized keywords 20% better than non-keywords. Furthermore, their recognition accuracy in the final syntagmatic position was 33% higher. Pauses of less than 750 ms, implemented before words, increased keyword recognition accuracy by 23%, and by 55% when such pauses occurred after keywords. Analogous effects for other words were practically absent.

The acoustic (including prosodic) features inherent in keyphrases are not sufficiently studied. A significant number of studies focus on extracting keyphrases from text, but far fewer works are based on spoken texts, and even fewer studies utilize information from audio signals, such as acoustic features. Automatic extraction of keyphrases from spoken language will be discussed in more detail in Section 2.4.

Chen et al. (2012) propose using the following groups of acoustic features:

- Duration-related features. The authors postulate that the duration of words when functioning as keywords may exceed their duration when they are not keywords. Based on this, the average duration of each phonetic unit from a corpus is calculated, and then the duration is normalized by the mean

value. Subsequently, for each keyword, its maximum, minimum, average, and range of normalized values are used as duration characteristics.

- Fundamental frequency (F0) features. It is validated that keywords may be distinguished by a wider fundamental frequency range compared to non-keyphrase segments. As with duration, maximum, minimum, average, and range of F0 values are calculated. This measurement is highly relevant because the fundamental frequency is an acoustic correlate of vocal fold vibration and functions as a crucial marker reflecting both the speaker’s affective state and the language-specific contours observed in spoken discourse.

- Spectral energy features. It is also confirmed that keywords are characterized by higher energy levels. In this regard, the authors (Chen et al., 2012) rely on cepstral coefficient data. The maximum, minimum, average, and range values are also calculated as characteristics.

Although the authors generally report positive results confirming their hypotheses, it is important to note that the study was conducted on English and Mandarin Chinese. Consequently, results may differ for other languages. Furthermore, acoustic features were examined not in isolation but in conjunction with lexical and semantic characteristics.

Among the phonetically significant features for the Russian language, Yagunova (2004) reliably confirms only the role of pauses as potential indicators of keyphrases in a text, while the connection between keyphrases and other acoustic features remains unclear.

Guseva et al. (2024) investigate the acoustic characteristics of keyphrases manually identified by participants in spoken popular science texts. An analysis using the OpenSMILE library and the eGeMAPS v0.2 feature set reveals the presence of acoustic correlates associated with keyphrases identification. However, only weak positive or negative correlations are found between

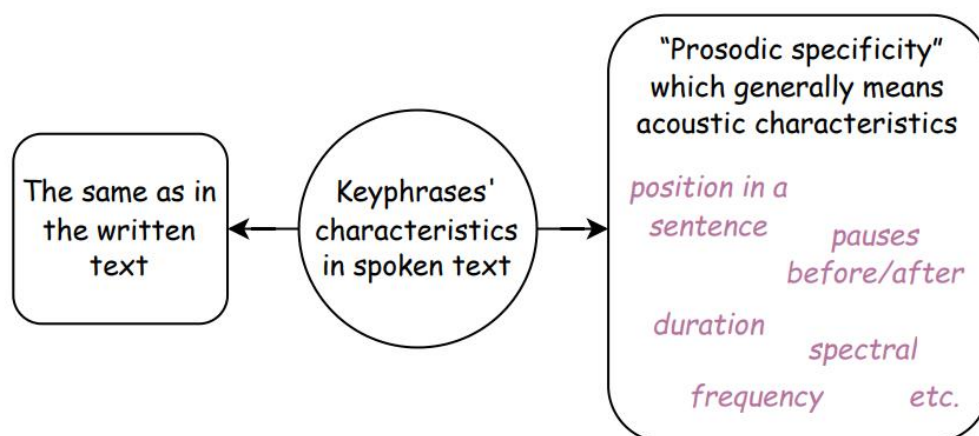
individual acoustic features and the keyphrases identified by participants. No significant correlations are found with the keyphrases' position in the sentence or pauses before/after them. A weak but consistent correlation is noted with spectral and frequency characteristics, suggesting that

Russian keyphrases might be characterized by a wider pitch range and greater energy, which aligns with findings from studies on other languages (Chen et al., 2012).

The features that may be significant when identifying keyphrases in a spoken text are illustrated in Figure 6.

Figure 6. Characteristics of keyphrases in spoken text

Рисунок 6. Характеристики ключевых выражений в устном тексте



2.4. Functions of Keyphrases

Research has described several primary functions of keyphrases, which are listed below in a progression that moves from macro-level text organization and system utility toward individual user memory and comprehension.

- Highlighting essential information. This allows distinguishing a text from others, classifying it, and assigning it to a specific thematic area (Gulyaev and Lukashevich, 2013).
- Information structuring. Information becomes more understandable and easier to perceive (Mitrofanova and Gavrilik, 2022).
- Document clustering. This facilitates grouping documents into relevant categories and simplifies information retrieval (Popova and Danilova, 2014).
- Content evaluation of documents. This information can be applied in algorithms for indexing, categorization, summarization, and document compression (Dubinina, 2020).

- Memory storage. The capacity of human working memory corresponds to the number of keyphrases typically comprising a set. This facilitates memorization and recall of information (Moskvitina, 2018).

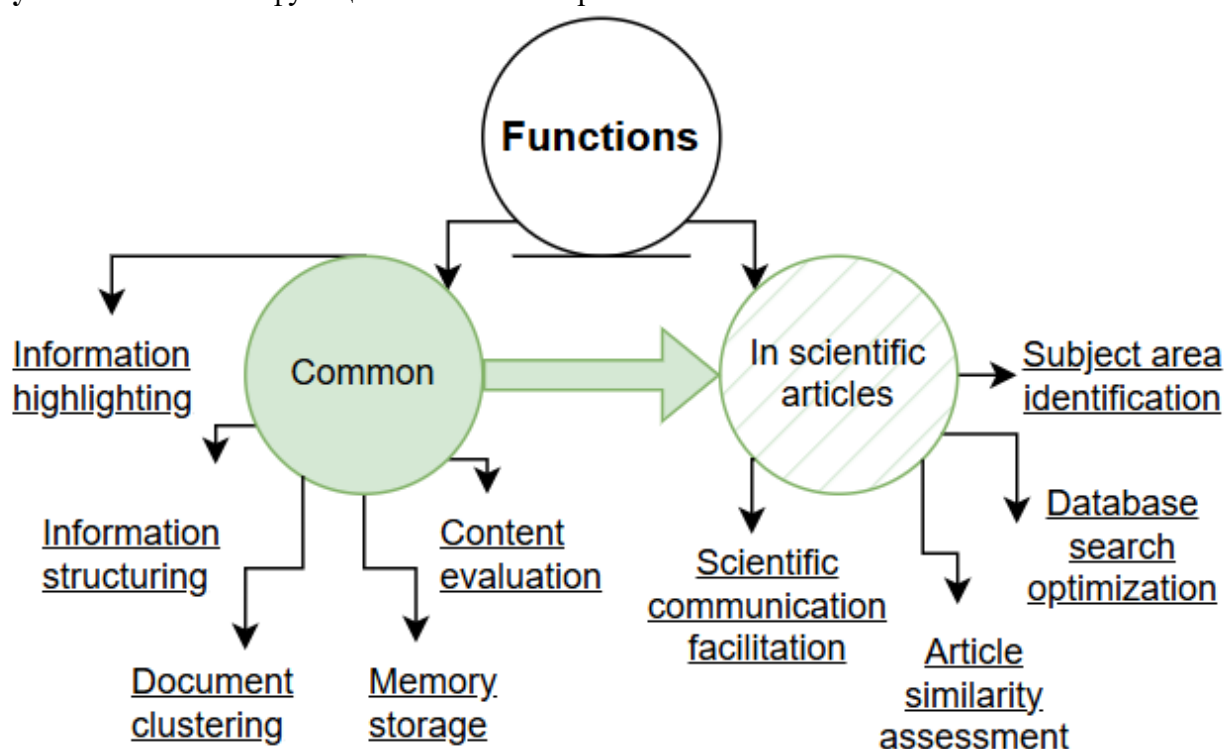
Among the functions of keyphrases accompanying scientific articles, the following are particularly highlighted.

- Determining the subject area of a scientific publication.
- Enabling retrieval of a desired article from a database via a search query.
- Gaining an understanding of article similarity without detailed content review (Abramov, 2011).
- Communicative function. Keyphrases help organize subject catalogs and scientific journals, simplifying the search for necessary information and accelerating the process of scientific communication (Moskvitina, 2009).

Thus, keyphrases perform several important functions, which are schematically illustrated in Figure 7.

Figure 7. Primary functions of keyphrases

Рисунок 7. Основные функции ключевых выражений



2.5. Frequency and Distribution of Keyphrases in the Original Text Structure

The selection of keyphrases is based on their frequency within a specific text, not the language as a whole (Bolshakova et al., 2011). For example, in an experiment using linguistic articles, participants without linguistic education who poorly understood the meaning of the presented texts identified linguistic terms that appeared most frequently in the texts as keyphrases (Sakharny and Shtern, 1988). In literary texts, words denoting the subject of description and/or characterizing characters and main plot events are often noted as key (Grudeva and Churilina, 2019; Yagunova, 2010).

In perceptual experiments, informants tend to include expressions in their sets that are not actually present in the text but convey its main idea (Grudeva and Gubushkina, 2020). Nevertheless, the study by Svetozarova and Shtern (1989) confirms that, despite the high variability in the sets of keywords, a core

emerges from the participants' responses, consisting of words chosen by all participants.

The uneven distribution of keyphrases within the structure of the original text also warrants consideration (Sakharny and Shtern, 1988). Words and collocations present in the title, abstract, introductory, and concluding sections of a text possess particular informativeness. This distribution is linked to the fact that these sections contain key information that facilitates rapid comprehension of the text's main idea and content (Kodzasov and Krivnova, 2001; Vasilyeva and Konkov, 2015). This is particularly characteristic of short texts, which are often used in perceptual experiments, where the theme is usually established at the beginning. Cases where keyphrases first appear at the end or in the middle of the text are less frequent. However, if substitute words (synonyms, pronouns, etc.) and the fact that words can appear repeatedly in the text are taken into account, their

distribution becomes more even (Svetozarova and Shtern, 1989).

2.6. Keyphrase set size

Many researchers, when deciding on the necessary volume of keyphrase sets for a text, rely on the approach proposed in (Sakharny and Shtern, 1988). Conducted experiments show that participants can work with virtually any number of expressions, but the most convenient predefined range, especially when dealing with spoken text, is a set of 7-10 words or collocations. Based on this, researchers recommend extracting 5 to 15 expressions depending on the text volume (Sakharny and Shtern, 1988). An extension of this approach is the identification of small, medium (sometimes), and large sets of keyphrases (Svetozarova and Shtern, 1989). Results obtained from analyzing 20 texts

of varying sizes (40-400 words), structures, and genre-stylistic affiliations indicate that the sets identified by auditors range from 5 to 20 expressions.

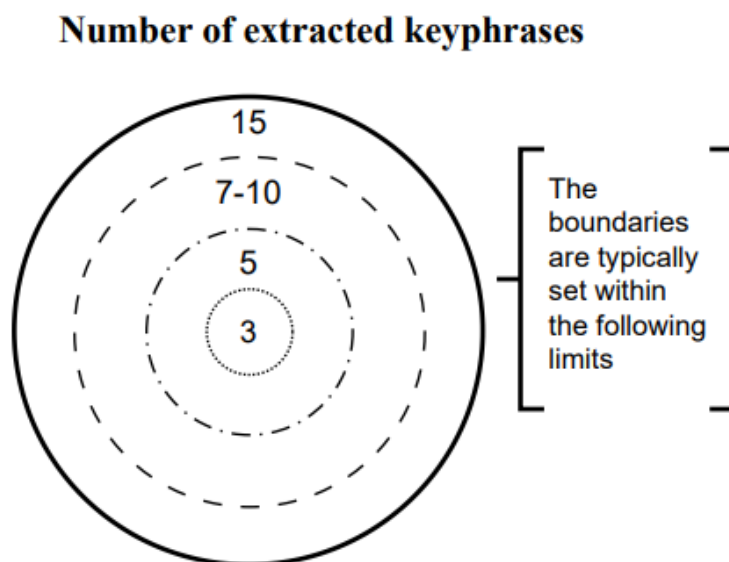
Various publishers and conference organizing committees typically recommend authors to provide 3-5 to 15 terms (Kamshilova, 2013). For example, when submitting an article to the international scientific journal *Terra Linguistica*¹ authors are required to provide 5 to 7 keyphrases.

While each additional keyphrase offers an opportunity to attract readers to an article (Abramov, 2011), accuracy in their selection is equally important. The chosen elements must carry fundamental information about the document (Kamshilova, 2013).

Thus, the boundaries for keyphrase sets are generally established within the range of 3 to 15 expressions (see Figure 8).

Figure 8. Keyphrase set size

Рисунок 8. Объём набора ключевых выражений



¹ Available at: <https://human.spbstu.ru> (Accessed 22.11.2025)

2.7. Manual and Automatic Keyphrase Extraction

Keyphrases can be extracted manually or automatically. In the former case, extraction can be performed directly by the text's authors (e.g., when submitting an application for a scientific conference), by subject matter experts, or by participants (Vanyushkin and Grashchenko, 2018). Schematically, the methodology for manual keyphrase extraction involves the following: after familiarizing themselves with a document, a participant selects a few words that, in their opinion, convey the main content of what has been read (or heard) (Sakharny and Shtern, 1988).

Discrepancies can arise where keyphrases identified by participants or even authors are either sparsely represented or entirely omitted within the source text (Mitrofanova and Gavrilik, 2022). In such cases, we speak of “present” and “absent” keyphrases in the text (Chen et al., 2020).

Manual keyphrase extraction is a highly labor-intensive process. Consequently, it is poorly suited for processing large volumes of text and working with corpus data. Furthermore, human selection is always subjective, as it depends on the reader's/listener's interpretation of the text.

Automatic keyphrase extraction, in a simplified sense, involves selecting words and collocations that most accurately convey the content of the document under consideration. In essence, this refers to the automatic identification of non-randomly occurring elements that are significant for the sample in the context of the overall dataset (Bolshakova et al., 2011). The extraction process occurs without human intervention and depends on the chosen model (Zhang et al., 2008). The significance level of an expression as a keyphrase is determined by its relative frequency of occurrence in experimental participants' responses (for manual extraction) or is calculated based on a specific algorithm (for automatic extraction) (Bolshakova et al., 2011).

Automatic keyphrase extraction methods are analyzed in detail in Section 3.

3. Automatic Keyphrase Extraction

3.1. Overview and Limitations of Automatic Keyphrase Extraction in Written Text

Automatic keyphrase extraction from text plays a significant role in Natural Language Processing (NLP). It is applied in tasks such as creating automatic information retrieval systems, document classification and categorization, content summarization and annotation, and others.

In recent decades, the volume of research in the field of automatic KE has significantly increased due to the greater availability of computational and informational resources (Vanyushkin and Grashchenko, 2017). Various automatic methods for keyphrase extraction exist, including statistical, hybrid (linguostatistical), machine learning-based, and structural approaches (classifications will be discussed in Section 3.3.). However, despite the diversity of approaches, the process of automatic keyphrase extraction still faces several challenges.

Hasan and Ng (2014) note the following factors influencing the complexity of keyphrase extraction.

- Volume of the source text. The longer the text, the more potential keyphrases there are, and the more difficult it is to extract them.
- Structural consistency. While keyphrases typically anchor to specific sections within structured documents, the disruption of this expected structural integrity challenges extractive algorithms dependent on positional cues.
- Topic shift within the document. If the subject of discussion changes, the keyphrases associated with the topic also change.
- Interconnectedness. Keyphrases in scientific and news articles are usually interconnected, but in informal texts, topics within a single document may be unrelated, complicating extraction.

The automatic extraction of multi-component keyphrases, particularly of certain types of lexical categories, presents a particular challenge (Sheremetyeva and Osminin, 2015). For example, noun phrases can include various parts of speech (nouns, adjectives, numerals, or their combinations). Consequently, correctly extracting keyphrases requires consideration of the morphosyntactic and semantic characteristics of the language.

Furthermore, automatic methods often require a large amount of training data. For the correct operation of ML algorithms, thematic text corpora with annotated keyphrases are necessary. Although the use of corpora enhances the accuracy of the keyphrase extraction procedure, applying such methods is often complicated by the absence of a corpus for a specific subject area or language.

Statistical algorithms also encounter different kinds of limitations in the task of automatic keyword extraction. While they do not require specialized linguistic knowledge bases and operate relatively quickly, they often yield unsatisfactory results. The scope of effective use for statistical methods is limited to morphologically poor languages, where the frequency of different word forms for a single lexeme is relatively high due to a comparatively small number of grammatical changes and inflections. These languages include, for example, English, Danish, Modern Chinese, and Vietnamese (Tsarfaty et al., 2013). Due to this characteristic, statistical methods may not be suitable for working with languages that have rich morphological systems (Russian, French, German, Arabic, Turkish, and others), where each lexeme has numerous word forms with low frequency in any given text.

Methods for automatic keyphrase extraction are developed for specific tasks, application domains, and languages. For instance, many available algorithms are designed for the English language and therefore require adaptation when working with other languages. Moreover, the choice of method depends on the functional style of the

text. For example, literary texts may contain a large number of metaphors, which are difficult to extract using statistical methods. This suggests that there is likely no universal method that can effectively work in all situations.

Thus, the applicability of various automatic keyword extraction algorithms is limited by a number of factors. To create effective methods, it is necessary to consider the typological characteristics of natural languages, subject domains, as well as the availability of linguistic and software resources.

3.2. Stages of Automatic Keyphrase Extraction in Written Text

The study by Vanyushkin and Grashchenko (2016) outlines three sequential stages for keyphrase extraction algorithms.

The first stage is text preprocessing. Preprocessing should be performed at all levels (graphemic, morphemic, lexical). Its goal is to represent the text in a format conducive to subsequent keyphrase extraction (Troshina, 2025). Differences arising at this stage are related to the necessity of working with different languages and/or are dictated by the specifics of a particular task. The following procedures may be applied to the text: tokenization (identifying word forms in the text), lemmatization (reducing various word forms to a single representation – the base form or lemma), markup removal, lexical normalization, part-of-speech tagging, and the use of a stop word list (removing a predefined list of stop words that lack semantic load, either generally or for a specific text). Performing text preprocessing procedures primarily involves the use of linguistic databases and dictionaries, which complicates the automation of this stage.

The second stage involves the recognition (classification) of keyphrase candidates obtained in the previous stage, or the filtering of candidates. The recognition procedure, as well as the use of various corpora and dictionaries, depends on the chosen automatic algorithm. Consequently,

the procedures performed at the second stage may or may not be language-dependent.

The third stage consists of the postprocessing of the obtained set of keyphrases. At this stage, the set is brought into the required format – truncated, ranked, ordered, etc.

A similar universal scheme for text keyphrase extraction is proposed in the work by Vinogradova and Ivanova (2016). The first stage involves text preprocessing. The second and third stages involve the selection of keyphrase candidates and their filtering according to predefined criteria (which depend on the chosen automatic method). The fourth stage is the final selection of

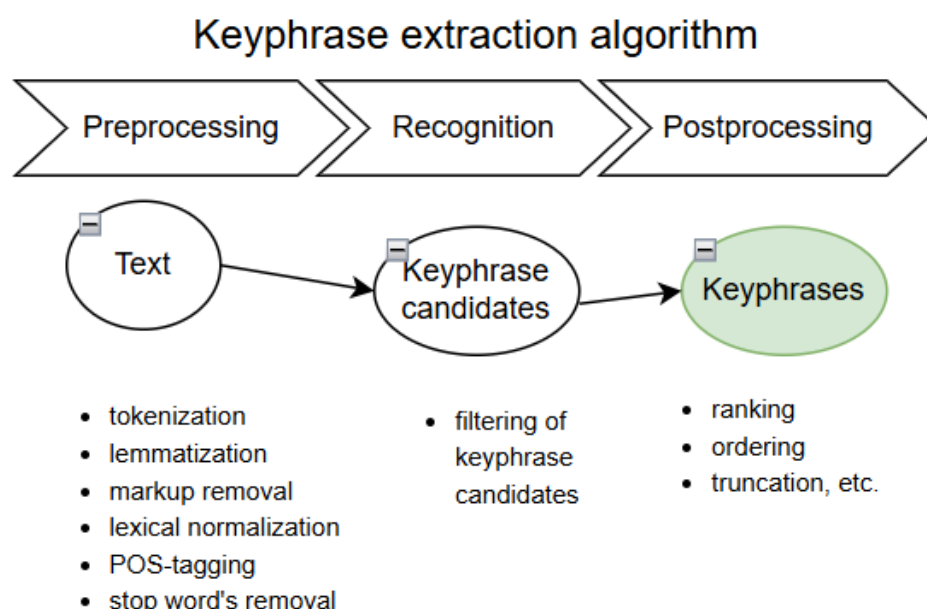
keyphrases from the set obtained after completing the previous steps.

In the study by Sheremetyeva and Osminin (2015), the procedures of forming and subsequently filtering a list of potential keyphrases are identified as common to various automatic algorithms. The extraction and ranking of keyphrase candidates are also discussed in the research by Wienecke (2020).

Thus, in general terms, the principle of keyphrase extraction using various automatic methods follows a unified logic, involving the sequential execution of text preprocessing procedures, keyphrase classification, and their presentation in a format determined by the task (see Figure 9).

Figure 9. Stages of automatic keyphrase extraction in written text

Рисунок 9. Этапы автоматического извлечения ключевых выражений из письменного текста



3.3. Classifications of Automatic Keyphrase Extraction Methods in Written Text

This section reviews several classifications of automatic keyphrase extraction methods in written text. A number of researchers divide automatic algorithms into just two main groups, including statistical and machine learning-based (Chen and Lin, 2010), or statistical and hybrid, with the latter

further considering sub-groups of graph-based and ML-based methods (Sheremetyeva and Osminin, 2015).

Vanyushkin and Grashchenko (2016) propose a more granular classification based on keyphrase recognition systems. Such systems categorize input data into two classes based on whether an element belongs to the keyphrases. Based on this, they suggest classifying methods along three facets by:

- type of learning (unsupervised, self-learning, and supervised)
- type of linguistic resources required (without usage, dictionary-based, ontology-based, based on annotated and unannotated corpora)
- type of mathematical apparatus of the keyphrase recognition system (statistical, neural network-based, hybrid, structural; the latter are further divided into graph-based and syntactic).

Morozov et al. (2023) also discuss classification by type of learning. Keyphrase extraction algorithms are divided into unsupervised and supervised learning methods. The first group of methods uses features to rank words in a text and select the required number of words with the highest rank. Statistical and graph-based methods operate in this manner. Supervised learning methods require a training set consisting of texts and a gold-standard list of keyphrases extracted from them (the set of standards is usually compiled by an expert) for preliminary algorithm tuning.

The authors of a previous study (Koloski et al., 2021), followed a similar approach, using supervised machine learning techniques to extract keyphrases from materials not only in the Russian language, but also in several low-resource languages (Estonian, Croatian, and Latvian).

In the subsequent analysis, we adhere to the classification of automatic keyphrase extraction methods into statistical, hybrid (linguostatistical), machine learning-based, and structural (graph-based). We then examine each of these groups in more detail and provide examples of specific algorithms.

It is important to acknowledge that the categorization of KE methods into distinct groups is inherently somewhat arbitrary, as many modern approaches combine elements from multiple paradigms. The categories we employ should therefore be understood as useful heuristics highlighting dominant characteristics rather than mutually exclusive boxes.

3.3.1. Statistical Methods for Keyword Extraction

As previously indicated in Section 3.1, statistical extraction methods are subject to inherent limitations. These methods are based on analyzing the frequency of words and their combinations within a text. While this approach does not necessitate prior training and allows for facile application to novel data, rendering them versatile, frequency alone is not always the most decisive factor in identifying the most important expressions for a text, which means these methods may be less accurate than those considering semantics and context (Sheremetyeva and Osminin, 2015). Nevertheless, the relevance of statistical methods increases when studying new subject areas and their terminology (Vinogradova and Ivanova, 2016).

In its simplest form, the overall frequency of word forms, reduced to their root (lemma) through stemming, is calculated. Word forms that are ranked by frequency and exceed a given threshold are considered to be keywords (Sheremetyeva and Osminin, 2015).

Chronologically, the first methods for automatic keyword extraction, discussed for instance in works by Piotrovsky et al. (1977) and Luhn (1957), were based on ranking all word forms (lexemes) found in a text by their frequency and selecting keyword candidates based on this principle.

Statistical methods include TF-IDF, Chi-squared, Log-Likelihood, PMI-test, T-test, and others.

The TF-IDF (Term Frequency-Inverse Document Frequency) measure is one of the most common statistical methods (Jones, 1972). The TF-IDF weight depends on how frequently a given expression appears in a specific document relative to its frequency in other documents within a corpus. The higher the frequency in the document under investigation and the lower it is in others, the greater the TF-IDF weight. Consequently, this approach allows for assessing the significance of a word or phrase for understanding a

document's content within the analyzed corpus.

The Chi-squared criterion quantifies the statistical significance of frequency differences. Unlike TF-IDF, it can be applied to a single text or a small sample of texts without requiring additional corpora or a list of comparison documents. The method's principle involves comparing observed frequencies with expected frequencies based on a hypothesis. A significant difference between observed and hypothesized frequencies indicates that the hypothesis is not supported. Constructing a co-occurrence matrix of expressions within a text enables a more precise estimation of the statistical significance of frequency differences. It also reduces the influence of low-frequency words that might receive disproportionately high scores due to matrix sparsity (Krasavina and Mirzitova, 2015).

The Log-likelihood association measure is typically used to quantify the degree of systematic association between parts of collocations (Zakharov and Khokhlova, 2014; Brezina et al., 2015). Based on the actual parameter values of data and their probabilistic model, this method yields parameter values that most accurately correspond to reality (Mitrofanova and Gavrilik, 2022). When applied to keyword extraction, the Log-likelihood association measure assesses how often words actually co-occur in a text compared to their random co-occurrence probability. If the probability of joint occurrence is significantly higher than expected by chance, it may indicate that these words form a keyword expression.

The PMI-test (Pointwise Mutual Information) metric measures the degree of association between an expression and a text or corpus. A high PMI score suggests that the expression frequently appears in the document or corpus and may therefore be a keyword.

The T-test method determines whether there is a significant difference between the average frequency of an expression's occurrence in the studied text and a control

text. A significant difference indicates that the expression is a keyword for the text.

3.3.2 Hybrid (Linguostatistical) Methods for Keyword Extraction

Hybrid methods for keyword extraction combine statistical and linguistic approaches, leveraging the advantages of both. Such algorithms can produce more accurate results than purely statistical methods because they consider various features for assigning keyword status to expressions:

- semantic (e.g., analysis of semantic relationships between words, such as synonymy, antonymy, and hyponymy);
- syntactic (e.g., analysis of sentence syntactic structure);
- morphological (e.g., part-of-speech tagging);
- lexical (e.g., frequency of expression usage in a specific domain or text type).

Furthermore, some hybrid methods can incorporate features specific to particular domains or text types. For instance, when extracting keywords from medical texts, the presence of medical terminology can be considered. However, hybrid methods are more complex and computationally intensive. Their effectiveness can also strongly depend on the quality of the training data used.

The RAKE (Rapid Automatic Keyword Extraction) method is domain-independent and does not require prior model training or corpus usage. It assigns weights to each word in a text based on its frequency and position. The original RAKE algorithm was developed for English (Rose et al., 2009). Versions adapted for Russian exist, accounting for features, such as cases and declensions (Moskvina et al., 2017). The algorithm performs syntactic analysis and tokenizes the text by punctuation and stop words. In the Russian-adapted algorithm, grammatical rules of a Russian-language syntactic parser based on NLTK (NLTK4RUSSIAN) can be used to define syntactic group boundaries. For each token, the following metrics are calculated: its frequency in the text and its degree of co-occurrence with other tokens (co-occurrence measure). After calculating these metrics,

each token is assigned a weight, computed as the ratio of its occurrence frequency to its co-occurrence degree. Tokens with the highest weights are considered semantically more significant for the document and are identified as keyphrases.

The YAKE (Yet Another Keyword Extractor) algorithm (Campos et al., 2020) is based on RAKE principles. However, it does not use stop words for tokenization and considers a greater number of metrics for calculating keyword weights:

- normalized word frequency;
- word position in the text;
- number of sentences containing the token;
- number of capitalized occurrences (casing);
- word relatedness to context; it is assumed that if a token has a high degree of similarity, it is less important for the context.

Keyphrases are selected based on weight ranking. Since YAKE extracts ready-made and frequent fragments from a text, it is suggested for use in summarization and similar tasks (Morozov et al., 2023).

For English texts, the Topia algorithm is used, extracting keywords based on text tokenization and morphological analysis of a corpus. For Russian, the analogous library RuTermExtract has been developed. The primary difficulties encountered when working with it are incomplete rules and ambiguity during morphological parsing.

Hybrid methods also include SpaCy, an advanced library for Natural Language Processing. This library enables keyphrase extraction by considering word frequency or the weight of distributed vector embeddings. Additionally, there is the linguistic toolkit PullEnti, which extracts keywords based on rules that consider morphological (morphological parsing is performed for each token separately) and semantic features.

Overall, the application of hybrid KE methods, combining statistical and linguistic approaches, allows for accounting for a greater number of factors and improving the

accuracy and completeness of results compared to using only one of these methods.

3.3.3. Machine Learning-Based Methods for Keyphrase Extraction

Machine learning-based algorithms are sometimes categorized as a subgroup of hybrid methods (Sheremetyeva and Osminin, 2015). Such methods typically require a corpus with pre-labeled keyphrases to create a training set and build a classifier. During training, keyphrases are marked as positive examples, and all other elements are marked as negative. Word vectors are generated based on specific parameters (e.g., TF-IDF measure, word length, word position in the title/first paragraph/last paragraph). The probability of a word combination belonging to the set of keyphrases is calculated, and a threshold for inclusion is set. After training, the model computes word relevance based on parameter vectors and determines the probability that a word combination expression is also a keyphrase.

ML-based methods include decision trees (Moskvina et al., 2018), Bayesian methods (Rose et al., 2009; Sheremetyeva and Osminin, 2015), Support Vector Machines (Vanyushkin and Grashchenko, 2016), and neural networks (Abrosimov and Mosyagina, 2022).

KeyBERT is a contextualized predictive model of distributed vectors, based on the original BERT model (Devlin et al., 2019). The method relies on a bidirectional transformer that converts sentences and texts into vectors to reflect their meaning. KeyBERT determines the cosine similarity of potential keyphrase vectors relative to the text in which they are presented and uses pre-trained models to calculate word relevance in context (Grootendorst, 2020). First, the text is processed using a pre-trained BERT model. Each word in the text is transformed into a feature vector representing its semantic meaning. Next, the algorithm calculates word relevance by comparing their feature vectors with the feature vectors of other words in the text. Relevant words are grouped into clusters, each representing a potential

keyword expression. From each cluster, the most representative word is selected and combined with other relevant words to form a keyphrase.

In addition to KeyBERT, other ML-based methods for keyphrase extraction exist. The KEA algorithm is quite common, based on a probabilistic classification model (Moskvina et al., 2017; Moskvina et al., 2018). Its effectiveness for the Russian language has been clearly demonstrated in a study by Sokolova and Mitrofanova (2018).

3.3.4. Structural (graph-based) Methods for Keyphrase Extraction

Structural methods, sometimes considered within hybrid KE approaches (Sheremetyeva and Osminin, 2015), are based on analyzing the text's structure and the relationships between its elements. These methods employ various algorithms to construct word graphs based on their relative positions in the text and identify keyphrases based on their significance within the graph. The vertices of the graph represent keyphrase candidates, and the edges connecting them are weighted according to the proximity of these candidates.

Methods differ in their candidate selection and proximity determination techniques, which are based on statistical, morphological, syntactic, and sometimes semantic analysis. One common structural method is TextRank. It is based on the PageRank algorithm, used by Google's search engine for ranking web pages (Mihalcea, 2004). The core idea of TextRank is to form a

weighted graph where nodes represent tokens, lemmas, or phrases, and edges reflect textual relationships, with weights indicating the strength and/or type of semantic connections. Keyphrase candidates with high ranks are considered more significant.

Other graph-based approaches include, for instance, the language-independent algorithm DegExt. In DegExt, stop words are filtered before graph construction. In the graph, edges between vertices connect only words that are adjacent in any sentence and are not separated by punctuation (Litvak, 2013).

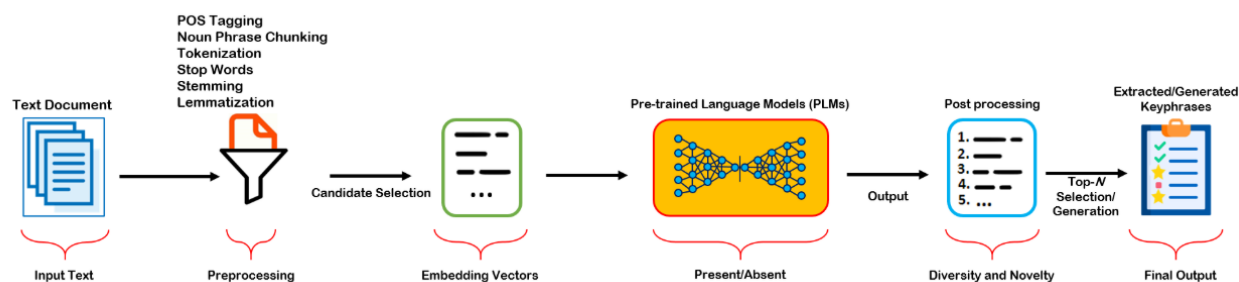
Some structural algorithms can utilize hypergraph models. In a hypergraph, any subset of vertices can form an edge. Such methods can be effective for large texts but are complex to implement and require significant computational resources.

3.3.5. Keyphrase generation

Keyphrase generation is a new approach that has emerged with the advent of Large Language Models (LLMs). LLMs can enrich and expand the keyphrase sets assigned to the text and predict topically determined lexical units that are observed or unseen in a given text. The applicability of keyphrase generation was evaluated primarily for the English datasets (Boudin, Aizawa 2025). Figure 10 shows that pretrained LLMs efficiently predict keyphrases present or absent in the texts, the core difference from keyphrase extraction being operations on embedding vectors.

Figure 10. Keyphrase prediction process (Umair et al., 2024)

Рисунок 10. Процесс предсказания ключевых выражений (Umair et al., 2024)



In recent works promising results were obtained by zero-shot and few-shot prompts for keyphrase generation by models from the GPT family. The paper (Martínez-Cruz et al., 2023) focuses on GPT models advantages in keyphrase generation taking into account domain adaptation and long document processing. The development of prompt engineering methods has shown advantages of zero-shot and few-shot prompts in keyphrase generation (Song et al., 2023). It was shown that the choice of prompt type and design improves the results, with a few-shot approach being more effective than zero-shot prompting.

Several studies give insights into hybrid techniques combining a set of instruction-based models or adjustment of instruction-based models and other approaches. In (Wang et al. 2024) a complex procedure for keyphrase generation is introduced, combining a zero-shot learning approach for knowledge graphs with LLMs, which includes keyphrase extraction, extension, retrieval and ranking. In (Shao et al., 2024) the authors introduced a one2set-based model as a keyphrase generator producing candidates which are further ranked by LLM select keyphrases from these candidates.

In Russian NLP prominent results were obtained by the NeuroRNC group (Glazkova et al., 2024; Glazkova, Morozov, 2024; Glazkova et al., 2025). The researchers introduced novel approaches towards keyphrase annotation of documents in large corpora and evaluated performance of classical techniques (TF-IDF, RAKE, KEA, TextRank, etc.) in the task of keyphrase extraction as well as LLMs for keyphrase generation in news texts and research papers. Recent advances deal with temperature effects and robustness of LLMs in keyphrase generation.

4. Automatic Keyword Annotation

The expansion of the information space and the necessity of analyzing extensive corpus data necessitate the automation of text indexing. Annotating keyphrases in texts placed in electronic collections is crucial for users to discover them via search engines. The implementation of the Semantic Web

project, which practically applies semantic markup standards using formal ontologies, along with Knowledge Graph technology, elevates the indexing task to a new level by specifying keyphrases as domain concepts, named entities, facts, relationships, and so on.

Modern corpus research involves working with diverse types of corpus annotation. Alongside fundamental annotation types (morphological, syntactic, pragmatic, word-formation), there are also applied types (discourse annotation, anaphora annotation, sentiment annotation, entity annotation, genre-thematic annotation, etc.).

Annotating keyphrases in text corpora allows for a content-driven approach to corpus searching, similar to web document searching. The goal of simple corpus search is to find all contexts with a target word or phrase. However, searching by keyphrases allows for forming a selection of documents where the query word is not accidental, peripheral, or insignificant to the text's content, but rather part of the text's semantic core. This is possible precisely because sets of keyphrases can convey text content in a concise and structured manner.

Corpus resources with keyphrase annotations are of high value, yet they are currently scarce.

In the study (Hulth, 2003) automatic keyphrase extraction is treated as a supervised learning task. The dataset used in the experiments consists of 2000 abstracts for journal articles on information technology in English with corresponding titles and keywords from the Inspec database. Each abstract has two sets of manually assigned keywords: a set of controlled terms, i.e., terms restricted to the Inspec thesaurus, and a set of uncontrolled terms. A series of classification models was trained using n-grams, part-of-speech patterns, noun phrase boundaries, statistical features. It was shown that the best result in precision was shown by the model trained with noun phrase boundaries, in recall – by part-of-speech patterns, and in the F-measure – by n-gram models.

The study (Nhuen and Kan, 2007) presents NUC corpus including texts from 120 scientific articles with annotated keyphrases. The authors used KEA as a baseline which was improved in a modified algorithm that considers keyphrase position in the text, part-of-speech tagging, and the use of acronyms and affixes typical of scientific terminology. The models were trained on the corpus with pre-annotated keyphrases. An unconventional technique was used in classification: a vector was formed with coordinates corresponding to the keyword frequency in different text sections (title, abstract, introduction, main sections, conclusion, references, etc.). That allowed it to significantly exceed the baseline.

The project by Wan and Xiao (2008) deals with the DUC2001 corpus used as a baseline for summarization. The corpus includes 308 news articles representing 30 topics. The average text length is around 740 tokens. Manual annotation was performed by 2 experts, with about 8 keyphrases per text, and an average keyphrase length of about 2 tokens. Automatic annotation used a hybrid approach: clusters of topically similar documents were formed taking into account cosine similarity of averaged text vectors, keyphrases were extracted within the clusters by means of ExpandRank algorithm, and then a set of keyphrases for individual documents within a cluster was identified by SingleRank algorithm. Keyphrase weights were determined as regards corpus-based metrics (frequency, types of lexico-grammatical patterns, etc.).

The study (Krapivin et al., 2010) describes a dataset of 2,000 publications from the ACM Digital Library in the field of information technology. The texts were preprocessed, annotated with OpenNLP, and segmented into text sections. In the experiments, the following models were trained: Support Vector Machine (SVM), Local SVM (FaLK-SVM), and Random Forest. The evaluation shows encouraging results which surpass KEA based on a Naive Bayes Classifier, improving the average F-

measure from 22% (KEA) to 30% (Random Forest) on the same dataset without using controlled vocabularies. The study demonstrates the importance of affixes and acronyms as keyphrase markers.

Mijić et al. (2010) present a keyphrase extraction algorithm implemented in a search engine for Croatian news texts. The algorithm is characterized by its simplicity, speed, and efficiency, involving candidate keyphrase identification considering word form and construction frequencies, lemmatization, and candidate ranking using the TF-IDF metric. To evaluate the algorithm's quality, a corpus with manual annotation was developed, including 1020 news texts annotated by 8 annotators. Keyphrase sets generated automatically and manually were compared across 4 parameters: exact keyphrase match, partial match (morphological variants, inclusion, etc.). The results indicate that automatic keyphrase annotation improves with the ability to filter keyphrase candidates by part of speech and lexico-grammatical patterns.

The research by Marujo et al. (2013) proved the significance of semantic and rhetorical features of keyphrases in a text corpus for their automatic annotation. For experiments, texts from 10 topics (technology, crime, sports, health, culture, fashion, science, business, world politics, US politics), divided into 85 subclasses, were combined into a corpus. In addition to standard keyphrase features (TF-IDF, text localization, number of word forms in a keyphrase, part of speech), semantic features (number of named entities, number of capitalized word forms, lexico-grammatical patterns, keyphrase frequency in a reference dataset, etc.) and rhetorical features (discourse markers for text continuation, logical inference, contrast, cause-and-effect relations, comparison, emphatic constructions, locations, etc.) were considered. After manual keyphrase annotation via crowdsourcing, 500 texts with the highest annotator agreement (around 90%) were selected. This set was used to train and test a decision tree classifier. The results

suggest that the quality of automatic keyphrase annotation is determined by both the topic and the semantic-syntactic and structural characteristics of the texts.

The study (Meng et al., 2017) presents the English-language KP20k dataset, aimed at a more complex formulation of the keyphrase extraction and generation task, as it compensates for the shortcomings of previous approaches and allows the inclusion of not only the observed words of the text in keyphrases but also their semantic correlates (synonyms, thematically related words). The dataset includes 20,000 computer science article texts with sets of keyphrases, titles, and abstracts. This corpus was formed by randomly selecting texts from a corpus of 567,830 articles. The solution for automatic keyphrase generation is implemented based on an RNN model in two versions – a classic RNN encoder and an encoder with a CopyRNN mechanism. A total of 2,780,316 (text, keyphrase) pairs were used to train the model. Testing was conducted on data from the INSPEC, Krapivin, NUS, SemEval 2010 corpora, and the test segment of KP20k. TF-IDF, TextRank, SingleRank, ExpandRank, KEA, and Maui were chosen as baseline methods. In tasks involving both predicting present keyphrases and absent ones, CopyRNN showed the best performance. The CopyRNN dataset and model were also applied to generate keyphrases in news articles of different topics, with results confirming the feasibility of cross-domain transfer.

In 2017, the SemEval competition was held, which included a track on automatic keyphrase extraction (Augenstein et al., 2017). The competition involved evaluating both the quality of the extracted keyphrases and their types and relationships in the original documents — articles on scientific topics. In particular, types of keyphrases such as PROCESS, TASK, MATERIAL, and relationships of synonymy and hypernym-hyponym were considered. The dataset used was a corpus including 100 noun phrases generated from titles and abstracts of articles

in physics, computer technologies, chemistry, and computer science. Annotation was performed by 3 annotators using 14 fine-grained types, including PROCESS. The dataset includes 500 texts.

Sterckx et al. (2018) describe a project for annotating keyphrases in a Dutch-language text corpus collected from Belgian media. The corpus comprises four topics, each containing 1,000 to 2,000 texts, including sports news, political news, societal news, and lifestyle news. Keyphrases annotation involved 357 volunteer annotators from various age and social groups. Each text was annotated by multiple annotators, who exhibited low agreement. This did not hinder experiments comparing manual and automatic keyphrase annotation, as it provided a sufficient amount of reference data. Unsupervised machine learning-based methods (TF-IDF, TextRank, Topical PageRank) were used for automatic keyphrase annotation, trained on the corpus considering several parameters: statistical (keyphrase frequency characteristics), structural (text localization), content-related (internal coherence of keywords), and others (lexico-grammatical patterns, inclusion of named entities, additional features from Wikipedia, WordNet thesaurus, etc.). Annotation quality was evaluated by comparing it to reference manual annotations, measured by precision, recall, and F1-score. Experimental results showed that the quality of keyphrase annotation depends on the text's topic. The best results were obtained for sports and political news segments, while texts from societal and lifestyle news segments showed lower scores for automatic keyphrase annotation quality.

The work (Gallina et al. 2019) describes the KPTime dataset, which includes about 280 thousand news messages and 10 thousand JPTimes articles with key phrases, annotated by editors. The experiments applied the MultipartiteRank and CopyRNN algorithms (CopySci and CopyNews).

In 2019, the OpenKP dataset was published, including about 100 thousand web documents with expert key phrase annotations (Xiong et al., 2019). The authors developed a new approach to key phrase extraction, namely, BLING-KPE, Beyond Language Understanding KeyPhraseExtraction — automatic key phrase extraction regardless of the domain, based on hybrid word embeddings and a convolutional transformer. The results surpass previous ones.

Russian keyphrase data is involved in few research projects.

Vanyushkin et al. (2019) present the results of keyphrase annotation of a corpus comprising 27 Russian texts from scientific, journalistic, and fiction scientific styles. The annotation was conducted by 24 native Russian speakers. Evaluation of text complexity, perplexity, compression ratio, dictionary richness, and entropy allows to determine lexical richness. As regards keyphrase parameters, researchers concluded that the optimal number of keyphrases is between 5 and 15 units, phrases should not exceed 5 words, and duplicate phrases, isolated function words, pronouns, and adverbs should be excluded from keyphrase sets.

A toolkit for keyphrase extraction from research abstracts was implemented in (Morozov et al. 2023), keyness features were extracted from Kiberleninka electronic library. While working with Russian scientific texts from CS&Math Russian text corpus in the task of keyphrase annotation and generation, the researchers tested a set of algorithms including TF-IDF, TopicRank, YAKE!, RuTermExtract, and a set of Transformer models, namely, KeyBERT, KeyBART, mT5 (Glazkova and Morozov, 2024). Results obtained with mT5 models were taken into account in the development of new RNC functionality for keyphrase search, considering genre-thematic annotation of news texts (Glazkova et al., 2024).

5. Review of Current Directions in Automatic Keyphrase Extraction from Spoken Language

With the growth in the volume of multimedia data (videos, music, podcasts, etc.), there is a need for effective approaches to their indexing and browsing. Since multimedia data can contain audio information, automatic keyphrase extraction from spoken language has become relevant (Yun-Nung et al., 2012).

Automatic Speech Summarization (SSum) has wide applications, including extracting key information from news (Maskey and Hirschberg, 2005), podcasts (Vartakavi and Garg, 2020), clinical conversations (Su et al., 2022; Le-Duc et al., 2024), and business meetings (Riedhammer, 2010). Typically, the task of extracting keyphrases from spoken text arises as one of the stages in SSum algorithms.

When raw speech is used as input, the summarization task involves creating a final summary presented in speech or text. Such a summary reduces information volume while providing an understanding of the main content without losing important information (Wang, 2022). For example, in online education, a major difficulty in mastering lecture courses is the lack of time to complete the full course. Utilizing keyphrases extracted from lectures is an effective way for listeners to familiarize themselves with the main concepts (Lee et al., 2014).

Approaches to speech summarization are generally divided into:

- extractive, which select the most important fragments of the source document without altering their structure or content;
- abstractive, which create new text that conveys the main content of the source document in a condensed form, but may differ from the original in structure and style (Wang, 2022).

The relationship between keyphrase extraction and speech summarization is fundamental. KE can serve as both a crucial component and often a primary objective of summarization systems. In extractive summarization, keyphrases represent the most salient content units that form the summary's building blocks. In abstractive approaches,

keyphrases help identify central concepts that must be preserved in the reformulated summary. Thus, advances in speech KE directly contribute to improved summarization quality.

In recent years, significant progress has been observed in applying Large Language Models (LLMs) for abstractive summarization of spoken documents. Despite LLM successes in summarization tasks, the capabilities of small language models (sLLMs) are also actively being explored. Ryu et al. (2024) proposed KEITSum, a method that allows sLLMs to generate more relevant texts by extracting and emphasizing key elements (named entities and concluding sentences) in the source text. The authors emphasize that KEITSum enables LLMs to compete with proprietary LLMs in dialogue and news summarization tasks.

Furthermore, based on their operational principles, SSum models can be categorized as transcript-based (relying on speech recognition) and acoustic-based (utilizing acoustic information).

The former type of models primarily uses Automatic Speech Recognition (ASR) mechanisms to convert audio signals into text, and then applies text summarization methods to produce a summary (Kotey et al., 2023). Such methods are popular due to the significant progress made in text summarization (Wang, 2022). A typical implementation approach is a cascaded method, where a text summarization (TSum) model processes the input text transcribed by an ASR system (Matsuura et al., 2023).

Since the first type of SSum models relies on ASR, keyphrases in this case are also extracted from recognized text data. Consequently, their extraction is carried out using the same methods applicable to keyphrase extraction from written text.

A drawback of models using SSum on top of ASR results is their dependence on the availability and quality of ASR mechanisms, which may perform poorly, for example, in noisy environments or with low-resource languages (Wang, 2022). Additionally, this

approach is limited by the lack of acoustic information that conveys the speaker's emotions (Matsuura et al., 2023).

An alternative direction is the development of the second type of models, which operate directly on the audio signal. However, approaches to speech summarization based on acoustic information are less popular and less studied in scientific literature.

One such approach recently proposed is E2E (end-to-end) SSum, which generates abstractive summaries directly from speech. It is not dependent on speech recognition errors and can fully utilize acoustic information. Despite promising results, such a model requires a large amount of training data and, in data-scarce conditions, generates unnatural sentences (Matsuura et al., 2023). The E2E approach has also been used in the Sen-SSum (sentence-wise speech summarization) algorithm, which generates text summaries from spoken documents on a sentence-by-sentence basis (Matsuura et al., 2024).

Shang et al. (2024) also proposed an E2E SSum model that uses LLMs to generate text summaries directly from speech features. The authors employ a multi-stage training approach, including ASR and text summarization (TSum) tasks as auxiliary ones, along with a curriculum learning strategy to facilitate the transition from TSum to SSum.

Wang (2022) proposed a three-stage extractive method, ESSumm, which also does not require speech recognition. The proposed architecture consists of segment generation, key segment extraction, and key segment merging stages. A pre-trained Wav2Vec2.0 model is used to extract deep features from the audio signal, which are then converted into multidimensional phoneme probability vectors using the k-means clustering algorithm. Subsequently, latent semantic analysis is applied to estimate the importance of audio segments based on the Euclidean distance between vectors. By directly processing the audio signal without ASR, the method is applicable to spontaneous conversations in live communication and

potentially for presenting the final result as audio files rather than text.

Alongside the development of new models, research efforts are actively underway to improve existing approaches. For instance, Freisinger et al. (2025) presented a hierarchical thematic segmentation algorithm for transcripts that generates multi-level tables of contents. This approach is based on fine-tuning LLMs using an adaptive LoRA method and considers speech pauses. Kano et al. (2025) proposed an integrated approach to extractive and abstractive speech summarization, demonstrating improved results by using auxiliary information obtained from extractive summaries. BN et al. (2025) investigated the problem of hallucinations in LLMs when summarizing medical texts and proposed methods for their detection.

In this context, an important direction is the development of methods for automatically evaluating summary quality. Kroll and Kraus (2024) proposed a paradigm for evaluating LLM-based spoken document summarization systems, considering the specificities of AI-generated content and adapting social science methodologies to ensure the reliability and reproducibility of human evaluation. Gong et al. (2025) introduced the CREAM framework for evaluating meeting summaries without reference texts, based on logical reasoning and the matching of key facts.

In conclusion, the task of automatic keyword extraction from spoken language is primarily considered as a stage of speech summarization and, depending on the summarization model, can be implemented either by methods for extracting keyphrases from written text or by processing the acoustic signal.

6. Discussion

Automatic keyphrase extraction is a well-established subfield of Natural Language Processing with a rich history of methodological development. As this review outlines, the field has evolved from simple statistical measures (e.g., Luhn, 1957) and linguostatistical approaches (e.g., Rose et al.,

2009) to graph-based algorithms (e.g., Mihalcea, 2004) and sophisticated machine learning models (e.g., Grootendorst, 2020). The primary goal has consistently been to automatically identify the most salient and topic-representative units within a document. Furthermore, the practice of automatic keyphrase annotation for corpus indexing, as detailed in Section 4, is a foundational practice in computational linguistics and information retrieval, providing the gold-standard data necessary for training and evaluating automated systems.

This review synthesizes this established knowledge to reveal a persistent and critical research gap: the significant disparity between KE methods developed for written text and those adapted for spoken language. While written-text KE is a mature field with numerous reliable methods, KE for speech remains a complex, underexplored challenge. This gap exists primarily because spoken language introduces variables largely absent in text: disfluencies, prosody, variable audio quality, and the inherent noise of the ASR process itself. Furthermore, the recent emergence of keyphrase generation using LLMs, as discussed in Section 3.3.5, represents a paradigm shift from extraction to creation, introducing new possibilities but also challenges related to factuality and controllability.

We aimed to provide a comprehensive analysis of contemporary theoretical approaches and practical solutions for automatic KE across both text and speech modalities. The methodology involved a systematic review and synthesis of literature spanning the terminological foundations, feature analysis, methodological classifications, and application domains of KE.

Our consolidation aligns with and extends previous surveys (e.g., Hasan and Ng, 2014). However, whereas previous reviews often focused on written text, our work explicitly contextualizes these methods against the challenges of spoken language and the new possibilities offered by LLMs. For instance, while traditional surveys discuss the

superiority of ML methods like KEA (Sokolova and Mitrofanova, 2018) or KeyBERT for certain tasks, our review highlights that their effectiveness for speech is contingent on the accuracy of the upstream ASR system, a dependency that acoustic-direct methods seek to bypass.

Therefore, we posit that the field is transitioning from a focus on purely extractive methods for written text towards a more integrated and generative paradigm that must account for multimodality (text combined with acoustics) and leverage the generative power of LLMs. There is no one-size-fits-all solution; the optimal KE strategy is highly contingent on the input modality (text/audio), language resources, domain specificity, and the desired outcome (extraction or generation). For example, a user processing a large corpus of scientific articles in English might achieve the best results with a fine-tuned KeyBERT model or an LLM for generation. In contrast, analyzing a noisy podcast recording might benefit from a hybrid approach that first uses a robust ASR system and then applies a graph-based method such as TextRank, or alternatively, experiments with an emerging E2E model that incorporates acoustic cues.

This review has several inherent limitations. Firstly, as a synthetic overview, it does not include original empirical comparisons of the discussed algorithms. Consequently, claims about the relative performance of different methods are based on interpretations of the cited literature rather than on controlled experimental data. Secondly, the field of NLP, and particularly the subfield of LLMs, evolves at an extremely rapid pace. Therefore, this review provides a snapshot of the state-of-the-art as of early 2025, and newer architectures or findings may have emerged since the literature collection cutoff date. Finally, while we strove for comprehensiveness, the sheer volume of research may have led to the omission of some niche or very recent studies.

The generalizations and claims made, particularly regarding the performance and applicability of different method categories, are intended as conceptual guidelines. Their validity in any specific practical application depends on numerous local factors, such as the quality of the input data, the specific implementation of an algorithm, and the tuning of its parameters.

7. Conclusion

This systematic review has delineated the evolution of automatic keyphrase extraction from its foundational statistical methods to modern neural and generative paradigms. The analysis was guided by the research questions posed in the introduction, and our findings provide insights that address their core concerns.

Our review has explicitly detailed how different disciplines, from information retrieval and psycholinguistics to computational linguistics and speech processing, define, operationalize, and utilize keyphrases (RQ1). We have shown that these methodological contributions are not isolated; techniques from one domain often inform and enhance approaches in another (RQ2). For instance, psycholinguistic insights into prosodic cues directly contribute to developing more robust extraction pipelines for spoken language. Combining psycholinguistic theories (e.g., on the role of prosody and perception) with information retrieval metrics (e.g., TF-IDF, graph-based centrality) holds immense potential for creating more accurate and human-like extraction models, particularly for challenging domains like noisy speech or informal discourse (RQ3).

The limitations of current methods and language-specific challenges were a central focus of our analysis. We concluded that the most persistent limitations involve domain and genre adaptation, the processing of morphologically rich languages, and the significant gap in performance between written and spoken text processing. The scarcity of annotated resources for languages

other than English remains a primary bottleneck (RQ5).

We find that LLMs are fundamentally reshaping the KE landscape, moving the field from extraction toward generation. While LLMs demonstrate a remarkable ability to generate absent, topic-related keyphrases, their application introduces new challenges related to output controllability, factual accuracy (hallucinations), and high computational cost (RQ6).

Finally, the most promising perspective for integration lies in multimodal systems that fuse textual features (from ASR transcripts) with acoustic-prosodic features (pitch, energy, duration) and leverage generative capabilities of LLMs. This integrated approach is essential for overcoming the current limitations and building robust, next-generation KE systems (RQ7).

The central conclusion that emerges is that KE is a profoundly context-dependent task. There is no universal solution. The future of effective KE lies not in a single algorithm but in developing a nuanced, multi-faceted toolkit. The optimal strategy must be carefully chosen based on the input modality, language, domain, and specific application requirements. Overcoming the current limitations, particularly concerning resource availability for non-English languages and the development of standardized multimodal frameworks, will be crucial for advancing the field and unlocking the full potential of automatic keyphrase extraction in managing the world's growing information ecosystem.

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Daria D. Guseva, teaching assistant at the Department of Phonetics and Language Teaching Methods, Faculty of Philology, Saint-Petersburg State University, Saint-Petersburg, Russia.

Дарья Дмитриевна Гусева, ассистент кафедры фонетики и методики преподавания иностранных языков, филологический факультет, Санкт-Петербургский государственный университет, Санкт-Петербург, Россия.

Olga A. Mitrofanova, PhD in Linguistics, Associate Professor, Department of Mathematical Linguistics, Faculty of Philology, Saint-Petersburg State University, Saint-Petersburg, Russia.

Ольга Александровна Митрофанова, доцент, кандидат филологических наук, доцент кафедры математической лингвистики, Санкт-Петербургский государственный университет, Санкт-Петербург, Россия.

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Tatiana A. Litvinova¹ 
Galina A. Zavarzina² 

**Metrics for Cultural Semantic Integrity in LLMs:
A Low-Resource Perspective**

¹ Voronezh State Pedagogical University,
86 Lenin St., Voronezh, 394043, Russia
E-mail: centr_rus_yaz@mail.ru
ORCID: 0000-0002-6019-3700

² Voronezh State Pedagogical University,
86 Lenin St., Voronezh, 394043, Russia
E-mail: zga1311@mail.ru
ORCID: 0000-0002-9129-9591

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Abstract: Multilingual large language models (LLMs) are predominantly trained and evaluated within English-centric pipelines. However, the semantic consequences of English-language mediation at the level of textual representations remain poorly understood beyond surface-level similarity measures. This paper puts forward a metric-based approach to evaluating the cultural and semantic integrity of texts produced using multilingual large language models (LLMs), with a specific focus on low-resource languages.

We set forth a set of complementary embedding-based metrics designed to diagnose how English mediation reshapes textual semantic representations at multiple levels. Using English-mediated back-translation via an LLM as a controlled diagnostic probe, we compare a high-resource language (Russian) with a low-resource language (Lingala). Texts are embedded into a shared semantic space, and semantic integrity is assessed using three metrics: Semantic Self-Similarity (SSI), capturing local semantic recognizability; Neighborhood Preservation Score (NPS), measuring the stability of local semantic relations; and axis-based drift, quantifying directional semantic bias along an interpretable semantic opposition.

The results reveal a pronounced cross-linguistic asymmetry. Russian texts maintain high semantic self-similarity, indicating strong surface-level semantic preservation, but display only moderate neighborhood preservation, reflecting nontrivial structural reorganization. In contrast, Lingala texts show severe degradation in both semantic self-similarity and neighborhood preservation, indicating a collapse of relational semantic structure under English mediation. Additionally, Lingala – but not Russian – exhibits a small yet systematic directional drift along the examined semantic axis. What is of importance is that this directional bias is independent of structural instability, which is indicative of multiple, distinct mechanisms of English-centric effect.

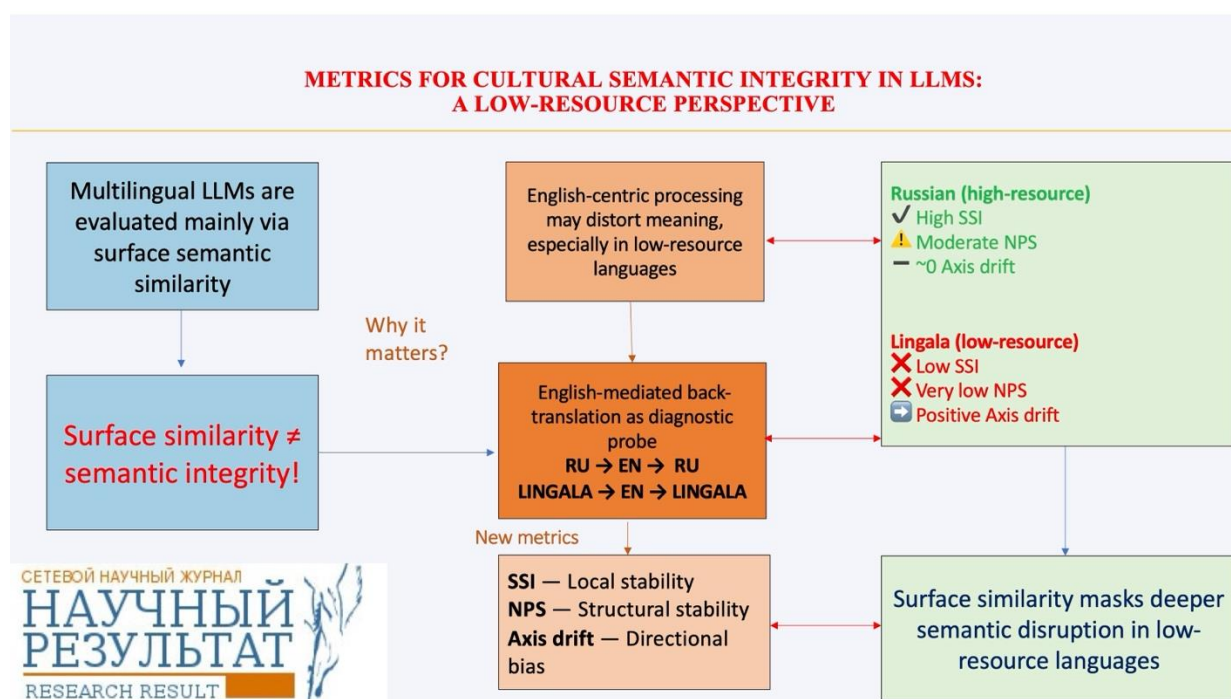
These findings indicate that surface similarity metrics considerably underestimate semantic disruption, particularly for low-resource languages. The suggested framework provides a scalable diagnostic toolkit for assessing semantic integrity in multilingual LLM representations and is directly applicable to the analysis and evaluation of LLM-generated texts beyond translation-based scenarios. Although we are validating the

framework using Russian and Lingala, the proposed metrics are intended for use with other low-resource languages and in multilingual settings.

Keywords: Cultural Semantic Integrity; Large Language Models; Low-Resource Languages; Semantic Drift; Multilingual Embeddings; English-Centric Bias.

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Т. А. Литвинова¹
Г. А. Заварзина²

Метрики культурно-семантической эквивалентности
для больших языковых моделей: взгляд со стороны
малоресурсных языков

¹ Воронежский государственный педагогический университет,
394043, Россия, Воронеж, ул. Ленина, 86
E-mail: centr_rus_yaz@mail.ru
ORCID: 0000-0002-6019-3700

² Воронежский государственный педагогический университет,
394043, Россия, Воронеж, ул. Ленина, 86
E-mail: zga1311@mail.ru
ORCID: 0000-0002-9129-9591

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Аннотация: Мультиязычные большие языковые модели (LLM) преимущественно обучаются и оцениваются на англоязычном материале как доминирующем в датасете. Однако семантические последствия опосредования английским языком их выдачи (например, в результате перевода либо при генерации текстов) на уровне текстовых представлений до сих пор остаются недостаточно изученными за пределами поверхностных мер семантического сходства. В данной работе предлагается метрико-ориентированная методология оценки **культурно-семантической целостности** текстов, созданных с использованием многоязычных LLM, с особым акцентом на малоресурсные языки.

Мы предлагаем набор взаимодополняющих метрик на основе мультиязычных эмбедингов, предназначенных для исследования эффекта влияния английского посредничества на нескольких уровнях. Используя англо-опосредованный обратный перевод с помощью LLM в качестве диагностического инструментария, мы сравниваем такое влияние на тексты на высокоресурсном (русский) и малоресурсном (лингала) языках. Тексты (оригиналы и обратные переводы) проецируются в общее семантическое пространство, а их семантическая эквивалентность оценивается с помощью трёх метрик: 1) метрики **семантического автосходства (Semantic Self-Similarity, SSI)**, отражающее семантическую близость текста-оригинала и текста после обратного перевода; 2) метрики **сходства семантических соседей (Neighborhood Preservation Score, NPS)**, измеряющей стабильность локальных семантических связей; 3) метрики **сдвига по семантической оси (axis-based drift)**, количественно описывающей семантическое смещение вдоль интерпретируемой семантической оппозиции.

Результаты исследования показывают выраженную межязыковую асимметрию. Русские тексты сохраняют высокую семантическую схожесть до и после перевода, что указывает на сохранение поверхностной семантики, однако демонстрируют лишь умеренную сохранность семантических соседей, отражающую нетривиальную структурную реорганизацию датасета. В противоположность этому тексты на языке лингала показывают резкое ухудшение как семантической схожести, так и сохранности семантических окрестностей, что свидетельствует о коллапсе реляционной семантической структуры под влиянием английского языка как промежуточного канала. Кроме того, лингала — в отличие от русского — демонстрирует небольшое, но систематическое направленное смещение вдоль рассматриваемой семантической оси. Принципиально важно, что данное направленное смещение не зависит от структурной нестабильности, что указывает на наличие нескольких различных механизмов влияния английского языка при посредничестве LLM.

Полученные результаты демонстрируют, что метрики поверхностного семантического сходства существенно недооценивают масштабы семантических искажений при обратном переводе, особенно в случае малоресурсного языка. Предложенная методика представляет собой масштабируемый диагностический инструментарий для оценки семантической эквивалентности текстов, созданных с помощью многоязычных LLM.

Ключевые слова: Культурно-семантическая эквивалентность; большие языковые модели; малоресурсные языки; семантический сдвиг; многоязычные эмбединги; англоцентричное смещение.

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1. INTRODUCTION

Large Language Models (LLMs) have rapidly become a fundamental infrastructure for natural language processing, enabling high-quality text generation, summarization, and translation across a broad range of languages. Their apparent multilingual competence resulted in widespread adoption of LLM-based pipelines for non-English content, frequently with no explicit consideration of how linguistic and cultural meanings might be structurally reorganized during internal representation and text generation.

A growing body of research has indicated that LLMs exhibit systematic biases, including demographic, social, and ideological biases, which might affect both

generated content and downstream decisions. Comprehensive surveys have shown that these biases are not isolated anomalies but rather structural properties of large-scale language models trained on heterogeneous and unevenly distributed data sources (Gallegos et al., 2024). These findings have given rise to extensive efforts in bias detection, evaluation, and mitigation within LLM outputs (Xu et al., 2025). However, most bias-focused evaluations concentrate on content-level distortions or decision outcomes, rather than in the underlying semantic structure of text collections.

Beyond well-studied social biases, recent research increasingly has been highlighting cultural and linguistic biases as a distinct and insufficiently explored

dimensions of LLM behavior (Narayan et al., 2025). Even multilingual models, which are explicitly trained to handle multiple languages, have been shown to disproportionately reflect English-centric semantic norms and evaluative patterns. Empirical evidence suggests that multilingual language models are not necessarily multicultural; they might encode moral and evaluative meanings in ways that align more closely with dominant English-language distributions than with language-specific conceptual systems (Havaladar et al., 2023). For a comprehensive review of over 300 papers related to benchmarks and methods used for cultural inclusion in multimodal language models, see Pawar et al. (2025).

In this study, we use cultural semantics in an operational, non-essentialist sense: we refer to language-specific patterns of meaning organization that reflect shared conventions, norms, and evaluative distinctions in usage, without equating a language with a single homogeneous culture. Accordingly, cultural semantic integrity denotes the extent to which these language-specific meaning organizations remain stable under English-mediated processing. Importantly, the paper does not claim to ‘measure culture’ directly; instead, it provides diagnostics for representational semantic distortion that may disproportionately affect culturally embedded distinctions in low-resource settings.

At the representation level, modern NLP systems rely heavily on distributional semantic embeddings, which map texts from different languages into a shared vector space. Models such as LaBSE and related multilingual sentence encoders were designed in order to support cross-lingual semantic comparability by means of aligning representations across languages (Feng et al., 2022). While these models achieve impressive performance on semantic similarity and retrieval benchmarks, prior research on bias in distributional representations has shown that embedding spaces can preserve and even amplify latent structural biases present in the training data

(Lauscher and Glavaš, 2019). Consequently, similarity in embedding space fails to guarantee the preservation of culturally salient semantic distinctions and, more importantly, the relational topology of semantic neighborhoods.

Recent research on multilingual and culturally aware language models has been highlighting the challenge of preserving local semantic structures amid the influence of dominant languages (Guo et al., 2025). Surveys of multilingual LLMs indicate that English frequently serves as a latent pivot language, shaping semantic organization even when models generate text directly in other languages (Guo et al., 2025; Nie et al., 2024). This suggests that non-English texts generated or transformed by LLMs might undergo a form of implicit semantic normalization, aligning them with English-centric discourse conventions.

In spite of these advances, existing evaluation frameworks predominantly concentrate on the answers provided by LLMs to culturally or socially sensitive questions or, in case of text analysis, on surface-level attributes such as fluency or translation accuracy. However, metrics commonly used to evaluate machine translation or text generation quality are not designed to detect structural semantic changes. Consequently, subtle yet systematic semantic reorganizations of texts influenced by LLMs might go unnoticed, especially in non-English and low-resource languages.

In this study, this gap is being addressed by means of introducing a framework for analyzing textual semantic integrity through LLM-based English-mediated back-translation. Rather than evaluating translation quality, we concentrate on how the textual semantic structure changes when texts pass through English as an intermediate representational space. Using back-translation through English as a controlled diagnostic probe, we make implicit semantic re-projection effects explicit and measurable. We operationalize semantic integrity by means of multilingual text-level embeddings and

quantify changes at three complementary levels: semantic self-similarity, neighborhood preservation, and the stability of culturally salient semantic oppositions. This framework is applied to two languages with distinct resource profiles: Lingala, representing a low-resource language with language-internal semantic structures, and Russian, representing a high-resource language with a well-developed non-English discourse tradition. By analyzing each language independently within a unified embedding space, we demonstrate that English-mediated processing induces systematic semantic reorganization across resource settings, with varying magnitudes and manifestations.

What is important is that, although the ongoing study makes use of back-translation as an explicit transformation, our goal is not to model real-world translation pipelines. Instead, back-translation serves as a methodological tool in order to isolate Anglocentric semantic re-projection, which also occurs implicitly during direct LLM text generation in non-English languages. Therefore, the suggested metrics are therefore applicable beyond translation scenarios, providing a foundation for analyzing semantic shifts in LLM-generated Russian texts and other non-English outputs.

This paper makes the following contributions:

1. Conceptual contribution. We introduce semantic integrity as a distinct evaluation dimension for multilingual LLM processing, emphasizing the preservation of structural semantic relationships rather than surface-level fluency or translation accuracy.

2. Methodological contribution. We set forth using back-translation through English as a controlled diagnostic probe that makes implicit Anglocentric semantic re-projection observable.

3. Metric contribution. We operationalize semantic integrity using a concise set of embedding-based metrics. Unlike standard evaluation metrics, these indicators capture changes in relational meaning and semantic topology.

4. Empirical contribution. We make use of the suggested framework to Russian and Lingala, which represent high-resource and low-resource languages, respectively.

Thus, by shifting the focus from surface adequacy to relational meaning, this study contributes to a more nuanced understanding of multilingual LLM behavior and highlights the need for evaluation frameworks that account for the preservation of cultural and semantic structures.

2. RELATED WORK

Although the ongoing study does not aim to assess translation quality of the texts, previous research on multilingual language models, machine translation, and text generation offers crucial context for understanding how semantic preservation is operationalized in evaluation practices. In most existing frameworks, semantic preservation is implicitly equated with semantic similarity, which is typically estimated either through surface-level overlap or embedding-based similarity between the system output and a reference text. The gradual transition from surface-level, n-gram overlap metrics to embedding-based similarity measures reflects significant progress in capturing meaning beyond lexical form, but also reveals limitations that motivate the current work.

Because similarity-based evaluation ultimately relies on the properties of multilingual representations learned during pretraining, it is essential to consider how these representations are formed and what biases they encode. Modern multilingual pretraining approaches, such as mBERT and related models trained using masked language modeling, have shown that one neural model can support cross-lingual transfer across many languages by means of learning shared language representations (Conneau et al., 2020). However, in practice, the distribution of training data remains heavily skewed toward high-resource languages, with English dominating both web-scale corpora and downstream benchmarks. Recent analyses

estimate that over 90% of the training data for many language models consists of English text (Brinkmann et al., 2025). As a result, multilingual representations frequently display systematic centering effects, where linguistic organization reflects dominant English-language distributions even when processing non-English inputs (Papadimitriou et al., 2023; Guo et al., 2024).

This English-dominated representational landscape is mirrored in machine translation, where English frequently functions as an explicit or implicit pivot language. Machine translation provides a particularly transparent case of English-mediated processing, as semantic representations are explicitly routed by means of English as an intermediate space, making the effects of English dominance directly observable. Parallel work in multilingual machine translation has therefore sought to reduce the English bottleneck by developing many-to-many architectures and large-scale data mining strategies designed in order to minimize reliance on English as an intermediate representation (Fan et al., 2021). While such approaches mitigate explicit English-centric pipeline dependencies, they fail to eliminate deeper representational influences arising from English-dominated pretraining.

A central methodological consequence of English-mediated processing concerns how meaning preservation has been evaluated in practice. Historically, evaluation of machine translation relied primarily on surface n-gram overlap metrics, with BLEU as the canonical example (Papineni et al., 2002). Although effective for measuring lexical correspondence, such metrics correlate imperfectly with meaning preservation, particularly for typologically distant languages, paraphrastic variation, or culturally loaded expressions. These limitations motivated the development of embedding-based or learned metrics intended in order to approximate semantic similarity beyond exact lexical overlap (Sun and Wang, 2024).

Metrics such as BERTScore (Zhang et al., 2019) operationalize semantic similarity through contextualized token representations and alignment-based matching, while learned metrics such as COMET improve correlation with human judgments by leveraging neural embeddings and contextual modeling (Rei et al., 2020). However, in spite of their use of neural representations, these approaches remain fundamentally reference-based and are optimized to assess semantic alignment with a target output. As such, they are not designed to test whether semantic identity and relational structure remain stable under transformation via translation.

A related perspective on transformation effects emerges from research on translationese (Liu et al., 2025), which has shown that translated texts display systematic surface-level and stylistic deviations from texts originally written in the target language. These deviations have been extensively studied as detectable traces of translation as a categorical phenomenon. While this line of work provides important insights into stylistic and distributional effects of translation, it primarily operates at the level of surface form and register.

We argue that English-centric processing in LLMs leaves deeper traces than those typically captured by translationese studies. Rather than producing only stylistic fingerprints, English mediation can induce structural and directional imprints in semantic space itself. From this perspective, translationese can be understood as a surface manifestation of more fundamental representational distortions. The metrics set forth in the ongoing study are designed in order to capture these deeper effects by analyzing semantic self-consistency and relational stability, rather than stylistic deviation alone.

These issues become particularly salient in culturally specific and low-resource settings. Recent advances in machine translation, especially multilingual pretrained models, have considerably improved translation quality for many low-resource

languages. Benchmarks such as Ethiobenchmark (Tonja et al., 2024) and models such as Toucan, an Afrocentric MT system supporting 156 African language pairs (Elmadany et al., 2024), demonstrate notable gains in translation accuracy across African languages.

In spite of this progress, a persistent gap remains in the effective translation and evaluation of culturally specific content due to the inherent cultural differences associated with various languages, not fully captured through MT techniques (Pawar et al., 2025). Moreover, many low-resource and mid-resource languages lack scalable evaluation benchmarks, and reliance on human annotation or community-driven data collection, while essential, is difficult to scale (Nekoto et al., 2020). Together, these limitations highlight the need for evaluation approaches that do not depend on large parallel corpora or culturally exhaustive reference sets, and that can operate under conditions of limited data availability (Rashid et al., 2025; Pawar et al., 2025).

One practical strategy for such evaluation is to make use of controlled transformations as diagnostic probes rather than as approximations of real-world pipelines. As such strategy, we apply backtranslation, a classic validation method of machine translation in which scholars compare an original text to a version of that text that has been translated from its original language to another language (in our case English) and then back again to the original (Moon et al., 2020). Recent work has explored backtranslation paired with sentence embeddings as a diagnostic strategy for assessing meaning preservation beyond surface overlap (Chew et al., 2025). Exceptional adaptability of LLMs in backtranslation (namely, GPT-4o-mini) was also indicated in recent paper (Wang and Lin, 2025).

The ongoing work extends this diagnostic perspective by means of systematically combining English-mediated back-translation with structure-sensitive

embedding analysis. Unlike standard MT metrics such as BLEU or BERTScore which evaluate translation accuracy relative to a reference, our metrics are reference-free and diagnostic in nature. By concentrating on semantic self-similarity, neighborhood preservation, and directional drift in embedding space, we capture changes in semantic integrity that remain invisible to surface-level or reference-based evaluation metrics.

3. MATERIALS AND METHODS

3.1. Data Collection and Corpus Construction

3.1.1. Russian Corpus

The Russian dataset was drawn from an existing experimental corpus of written texts produced by the same group of authors under controlled conditions (Litvinova et al., 2016; Litvinova, 2021). All of the texts were originally authored by native Russian speakers and annotated with multiple metadata variables, including text type, author identifiers, and psychometric measures. For the purposes of the ongoing study, only the text content and text type annotations were made use of.

Two text types were selected: descriptive texts and narrative texts. These genres were chosen because they represent common and functionally distinct modes of written discourse while being produced by the same authors, thereby controlling for individual stylistic and lexical variation. In order to avoid sample size imbalance and genre-related confounds, an equal number of texts was randomly sampled from each genre.

Prior to sampling, texts were filtered to remove empty entries and non-textual artifacts. Document length was measured as the number of whitespace-separated tokens. After genre balancing, an empirical length window was determined based on the 10th and 90th percentiles of word counts in the balanced Russian subset. Only texts falling within this window were retained. Following this procedure, a total of 483 Russian texts were selected for further analysis. Document

lengths in the final Russian corpus ranged from 74 to 244 words.

The Russian corpus was treated as a single-language reference set; text type was not modeled as an independent experimental factor because the analysis focuses on within-text semantic stability under transformation, rather than on between-genre variation.

3.1.2. Lingala Corpus

The Lingala data were derived from a large cleaned corpus of Latin-script Lingala text containing over 500,000 textual lines (*NLLB Team*). The original corpus had previously undergone standard normalization procedures, including lowercasing, removal of punctuation and digits, whitespace normalization, and trimming of empty lines.

Because the Lingala corpus consisted of short textual units rather than document-level texts, an additional document construction step was required. Lingala documents were created by concatenating consecutive cleaned lines into fixed-size blocks. The number of lines per block was treated as a tunable parameter and optimized to produce document-level texts comparable in length to the Russian corpus. It is to be noted that while concatenation might introduce heterogeneous discourse boundaries, this procedure was applied uniformly and was intended to approximate document-level semantic structure rather than discourse coherence.

Specifically, candidate block sizes ranging from 6 to 30 lines were evaluated. For each block size, documents were constructed and their word counts computed. The block size that maximized the number of documents falling within the Russian length window (74–244 words) was selected. This procedure yielded a block size of six lines per document, producing Lingala documents with a median length of approximately 105 words.

Following the document construction, Lingala texts were filtered using the same length window as the Russian corpus. A random sample of 483 Lingala documents was then selected to exactly match the size of the Russian dataset. Final Lingala document

lengths ranged from 74 to 224 words, with a mean of approximately 110 words. This length-matching strategy was adopted to reduce confounding effects of document length on embedding-based similarity measures.

3.1.3. Corpus Alignment and Final Dataset

The final dataset consisted of 966 documents in total, comprising 483 Russian and 483 Lingala texts. The two language subsets were balanced with respect to the number of documents and broadly comparable in document length distributions. Word count was retained as a tracked variable and later used for robustness checks to ensure that observed effects were not driven by length differences.

Each document was assigned a unique identifier and labeled with a language tag (RU or LN). Only the document identifier, language label, and text content were used as inputs to subsequent processing stages, making sure that all of the downstream analyses operated on fully anonymized textual data.

This corpus construction strategy was designed to satisfy three key criteria: 1) comparability across languages in terms of document length and format; 2) control over author-related variability in the Russian data; 3) scalability to larger corpora and additional languages.

What is important is that the goal of this stage was not to create linguistically homogeneous or genre-pure corpora, but to construct document-level datasets suitable for probing the stability of semantic structure under controlled transformation using embedding-based methods.

3.2. Methodology

3.2.1. English-Mediated Back-Translation as a Diagnostic Probe

Rather than treating translation as an end task, we make use of English-mediated back-translation as a controlled diagnostic probe in order to identify structural semantic

changes induced by English-centric processing. The key idea is to keep the intended meaning fixed by design while forcing the text to pass through English as an intermediate linguistic channel.

Formally, for each original text T in language L , we construct an English-mediated back-translated version T^{BT} using a two-step translation process. The text is first translated from L into English, yielding T^{EN} , and then translated back into the original language (Figure 1).

Figure 1. Scheme of English-mediated back-translation as a diagnostic probe

Рисунок 1. Англо-опосредованный обратный перевод как диагностический инструмент

$$T \xrightarrow{L \rightarrow EN} T^{EN} \xrightarrow{EN \rightarrow L} T^{BT}$$

This transformation makes English an explicit intermediate representation, enabling controlled analysis of semantic transformations induced by English mediation.

Both translation steps are performed by means of the same large language model (gpt-4o-mini) via the OpenAI Responses API. For each step, decoding was run with temperature = 0 and a fixed prompt template instructing the model to preserve meaning and to output only translations. Namely, we used the following prompt: **You are a precise translator. Translate the user's text to {TARGET_LANGUAGE}. Preserve meaning, register, and named entities. Avoid unnecessary rephrasing. Do not add explanations, comments, or extra text. Output only the translation. Source language: {SOURCE_LANGUAGE}.** To prevent output expansion, fixed maximum number of output tokens was imposed. Requests were cached by a hash of the input text and language to ensure reproducibility and to allow resumable processing under rate limits. This design minimizes stochastic generation effects and makes sure that

observed differences between T and T^{BT} are unlikely to be driven by sampling variability.

What is of importance is that we do not interpret back-translation quality in terms of fluency or adequacy. Instead, back-translation serves as a stress test of semantic stability: if semantic representations are stable under English mediation, then T and T^{BT} should occupy similar positions in semantic embedding space. Conversely, systematic divergence indicates that English acts as a non-neutral filter capable of reorganizing semantic structure.

This probing strategy has two advantages. First, it isolates the effect of English mediation independently of downstream task objectives or application-specific evaluation criteria. Second, it applies uniformly to both high-resource and low-resource languages, enabling controlled cross-linguistic comparison. It is to be noted that although back-translation is used as an explicit transformation in this study, it is not intended to model real-world translation pipelines. Rather, it functions as a methodological tool for exposing Anglocentric semantic re-projection mechanisms that may also operate implicitly during direct non-English text generation by means of multilingual LLMs.

3.2.2. Semantic Representation and Embedding Space

In order to quantify semantic stability under English-mediated transformation, all of the texts were embedded by means of a multilingual neural embedding model (text-embedding-3-small via OpenAI Responses API). The embedding model supports multilingual inputs and produces representations for both high-resource and low-resource languages, including Lingala, within a shared vector space.

Although such models are frequently referred to as “sentence embedding” models, in the present study embeddings are computed over entire documents rather than individual sentences. Each input text – original or back-translated – is passed to the embedding model

as a single sequence, yielding one vector per document. This choice is indicative of the analytical focus of the study: semantic integrity is evaluated at the level of global textual meaning, rather than at the level of isolated lexical items or sentence fragments.

This text-level representation is essential in order to capture higher-order semantic relations, including thematic coherence, evaluative orientation, and relational structure across concepts, which might not be observable from word-level or sentence-level embeddings alone.

Because all of the texts are embedded by means of the same model and the same representational geometry, differences between vectors can be interpreted as semantic differences induced by transformation, rather than as artifacts of incompatible embedding spaces. In particular, comparing each text to its own back-translated version within the same space avoids the need for external alignment procedures or language-specific normalization.

This approach is different from traditional cross-lingual studies that rely on separate monolingual embedding spaces aligned post hoc via bilingual dictionaries or linear transformations. By means of operating directly in a unified multilingual space, we make sure that observed semantic shifts reflect changes in representation induced by English mediation, rather than alignment noise or cross-space mapping error.

What is of importance is that all of the semantic comparisons are performed within-text, comparing each document only to its own back-translated version. This design ensures that any systematic differences observed cannot be attributed to topic variation, author identity, or content mismatch, but instead are indicative of changes induced by the English-mediated transformation itself.

It is important to highlight that the embedding model is treated as a measurement instrument rather than a ground-truth representation of meaning. While the same

multilingual embedding space is used for all languages, the absolute fidelity with which different languages are represented might vary. However, because all analyses rely on relative, within-text comparisons between an original text and its back-translated counterpart, transformation-induced semantic shifts can be assessed reliably even in low-resource settings.

3.2.3. Metrics

Semantic Self-Similarity (SSI)

The first evaluation metric captures local semantic stability between a text and its English-mediated reconstruction. For each text i , we compute **Semantic Self-Similarity (SSI)** as the cosine similarity (1) between the embedding of the original text $\mathbf{e}_i$ and that of its English-mediated back-translated version $\mathbf{e}_i^{BT}$:

$$SSI_i = \cos(\mathbf{e}_i, \mathbf{e}_i^{BT}). \quad (1)$$

SSI quantifies the degree to which a text remains semantically recognizable to itself after passing through English as an intermediate representational channel. Unlike BERTScore, which evaluates semantic alignment between an output and a reference, SSI evaluates whether a text remains semantically recognizable to itself after English-mediated transformation.

In practice, SSI values observed in our experiments are in the interval $[0,1]$, with higher values corresponding to greater semantic stability. SSI is a purely local, within-text metric: it evaluates each document in isolation and does not take into account its position relative to other texts in the embedding space. As a result, SSI alone fails to capture changes in relational or structural meaning, such as collective shifts of texts within the semantic space or reorganization of local semantic neighborhoods.

Consequently, high SSI does not imply full preservation of semantic structure at the corpus level. Texts might remain individually recognizable while undergoing systematic reconfiguration in their relations to other

texts. For this reason, SSI is complemented by structure-sensitive metrics that explicitly capture neighborhood stability and directional semantic drift.

Neighborhood Preservation Score (NPS)

In order to assess structural semantic stability, we introduce the **Neighborhood Preservation Score (NPS)**, which evaluates whether a text retains its relative position among other texts in the semantic space after English mediation. Unlike SSI, which captures semantic recognizability in isolation, NPS explicitly measures changes in relational meaning.

For each original document embedding $\mathbf{e}_i$, we identify its set of k nearest neighbors N_i within the corpus by means of cosine similarity. The same procedure is applied to the embedding of back-translated text $\mathbf{e}_i^{BT}$, yielding a corresponding neighbor set N_i^{BT} . Nearest-neighbor search is performed within the same language subset to avoid cross-lingual contamination.

Neighborhood preservation (2) is quantified using the Jaccard similarity between the two neighbor sets:

$$NPS_i = \frac{|N_i \cap N_i^{BT}|}{|N_i \cup N_i^{BT}|}. \quad (2)$$

In the ongoing study, we fix $k = 20$, balancing sensitivity to local semantic structure against robustness to noise. Jaccard similarity is used because it captures changes in neighborhood composition independently of rank order, concentrating on whether semantic affiliations are preserved rather than on fine-grained distance fluctuations.

NPS values close to 1 indicate that a text maintains its relative position among semantically similar texts, while low values signal a reorganization of semantic topology.

Crucially, a text may exhibit high SSI but low NPS, indicating that while its overall meaning remains recognizable, its semantic affiliations within the corpus have shifted. This distinction is central to present analysis: NPS captures the extent to which English mediation reshapes the local structure of language-specific semantic spaces, revealing changes that remain invisible to text-level similarity measures alone.

Directional Semantic Drift along Interpretable Axes

In order to examine whether English-mediated processing induces directional semantic bias beyond structural instability, we performed an axis-based analysis by means of predefined moral–evaluative oppositions. For each language, an interpretable semantic axis was constructed from a small set of seed words representing positive and negative poles of a broadly shared moral dimension. For Russian, the positive pole was defined by the words *честность* (honesty), *достоинство* (dignity), and *справедливость* (justice), while the negative pole consisted of *ложь* (lie), *предательство* (betrayal), and *подлость* (meanness). For Lingala, the positive pole included *malamu* (good) and *bosantu* (purity/virtue), and the negative pole included *mabe* (bad) and *mbindo* (impurity).

The axis vector was defined as the difference between the mean embeddings of the positive- and negative-pole seed words, by means of the same multilingual embedding model as for document representations. Each document embedding was projected onto the corresponding language-specific axis using cosine similarity, yielding an axis projection score that indicates the document’s position along the semantic dimension.

Directional semantic drift is quantified as the difference between axis projections of the back-translated and original text:

$$\Delta\text{AXIS}_i = \cos(\mathbf{e}_i^{BT}, \mathbf{a}) - \cos(\mathbf{e}_i, \mathbf{a}), \quad (3)$$

where e_i and e^{BT}_i denote the embeddings of the original and back-translated versions of document i , respectively, and $\mathbf{a}$ denotes the axis vector.

Positive drift values indicate systematic movement toward the positive pole of the semantic axis under English mediation, while negative values indicate movement toward the negative pole. Importantly, the axis is used here as a diagnostic probe rather than as an exhaustive model of moral semantics. The goal is not to fully characterize cultural meaning, but rather to test whether English mediation induces consistent directional reorientation along an interpretable semantic dimension. In order to compare drift distributions across languages, we applied a Wilcoxon rank-sum test.

3.2.4. Summary of Evaluation Framework

Together, SSI, NPS, and axis-based drift provide a three-level diagnostic framework for evaluation of semantic integrity under English mediation. SSI (local stability) assesses whether a text remains semantically recognizable in isolation. NPS (structural stability) evaluates whether a text preserves its local semantic neighborhood within the corpus, capturing changes in relational meaning and semantic topology. Axis drift (directional bias) captures systematic movement along interpretable semantic dimensions induced by English mediation.

By means of combining these complementary metrics, the framework enables us to distinguish between qualitatively different modes of semantic change: surface-level semantic preservation (high SSI), structural semantic reorganization (low NPS), directional semantic bias (non-

zero axis drift), semantic breakdown (low SSI and low NPS).

Applying this framework to a low-resource language (Lingala) and a high-resource reference language (Russian) allows us to disentangle baseline effects of English-mediated processing from language-specific vulnerability. The suggested methodology is model-agnostic, scalable, and directly applicable both to translation-based diagnostic probes and to the analysis of texts generated directly by LLMs in non-English languages.

4. RESULTS

4.1. Semantic Self-Similarity under English-Mediated Back-Translation

Semantic Self-Similarity (SSI) reveals a pronounced asymmetry between Russian and Lingala texts under English-mediated back-translation.

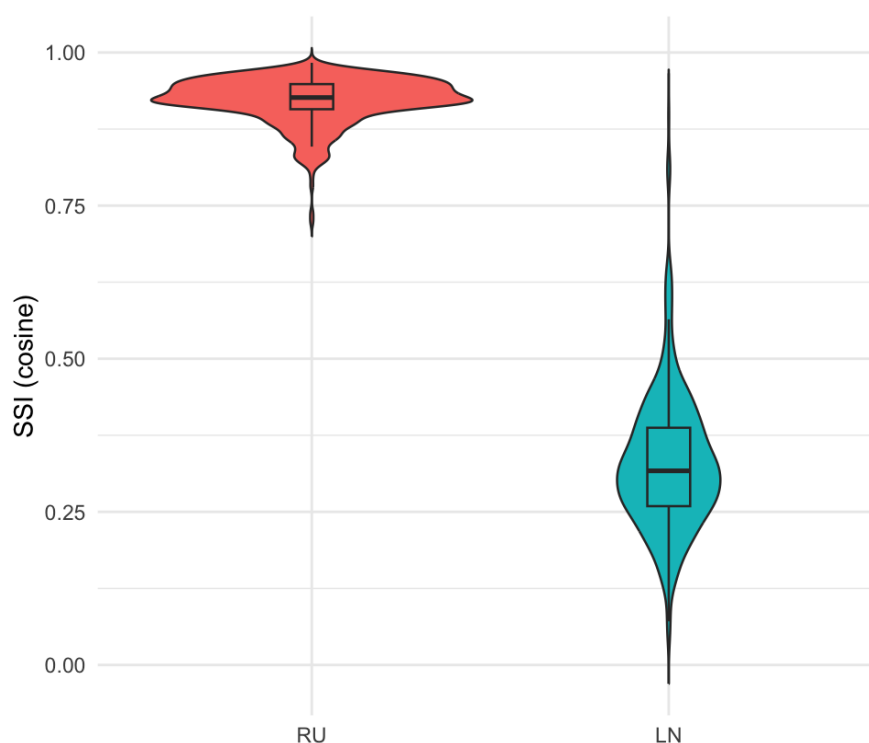
For Russian, SSI values are consistently high (mean = 0.922; median = 0.926), with a narrow interquartile range (Q1 = 0.907, Q3 = 0.948). This indicates that, at the level of pairwise semantic similarity, Russian texts largely preserve their original meaning after passing through English.

Conversely, Lingala displays considerably lower SSI (mean = 0.329; median = 0.317), with a broader dispersion (Q1 = 0.259, Q3 = 0.387). These values indicate that English-mediated processing substantially reduces semantic self-recognizability for Lingala texts even at the level of self-similarity (Figure 2).

Importantly, the Russian results demonstrate that high-resource languages may appear semantically stable when evaluated solely through local similarity metrics, potentially masking deeper representational shifts.

Figure 2. Semantic self-similarity (SSI) by language

Рисунок 2. Семантическое сходство (SSI) по языкам



4.2. Neighborhood Preservation and Structural Semantic Stability

Neighborhood Preservation Score (NPS) provides a complementary view by means of capturing changes in relational semantic structure.

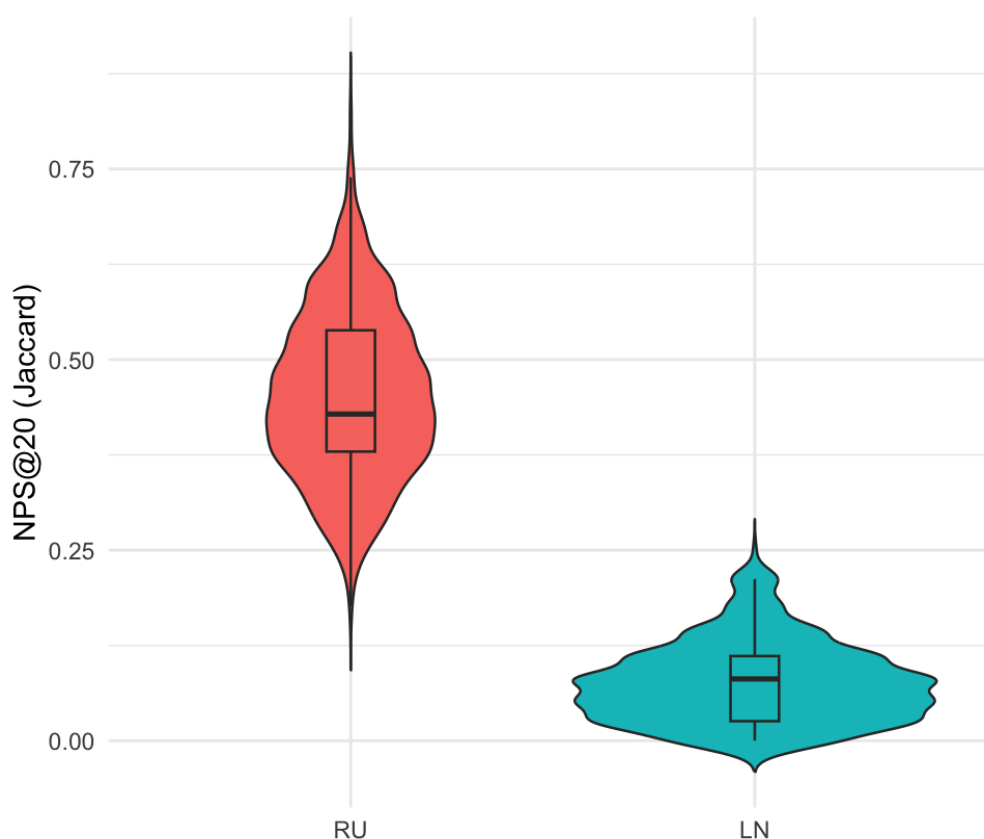
Russian texts retain a substantial portion of their semantic neighborhoods after back-translation (mean = 0.453; median = 0.429), indicating moderate structural stability. Although imperfect, this level of preservation suggests that English mediation fails to

radically reorganize the Russian semantic space.

Lingala texts, conversely, display extremely low neighborhood preservation (mean = 0.075; median = 0.081). In lots of cases, the intersection between original and back-translated nearest-neighbor sets is minimal, with first-quartile values close to zero. This implies that, even when some surface meaning is retained, Lingala texts are systematically repositioned within the semantic space after English mediation (Figure 3).

Figure 3. Neighborhood Preservation Score (NPS) by language

Рисунок 3. Коэффициент сохранности семантических соседей (NPS) по языкам



The observed effect sizes are exceptionally large (Cohen's $d = 7.09$ for SSI and $d = 4.47$ for NPS). This magnitude indicates not a marginal shift but rather a near-complete separation between the distributions of high-resource and low-resource languages under English-mediated processing.

Rank-based effect sizes (Cliff's $\delta=0.99$) further confirm near-complete distributional separation between languages. In over 98% of

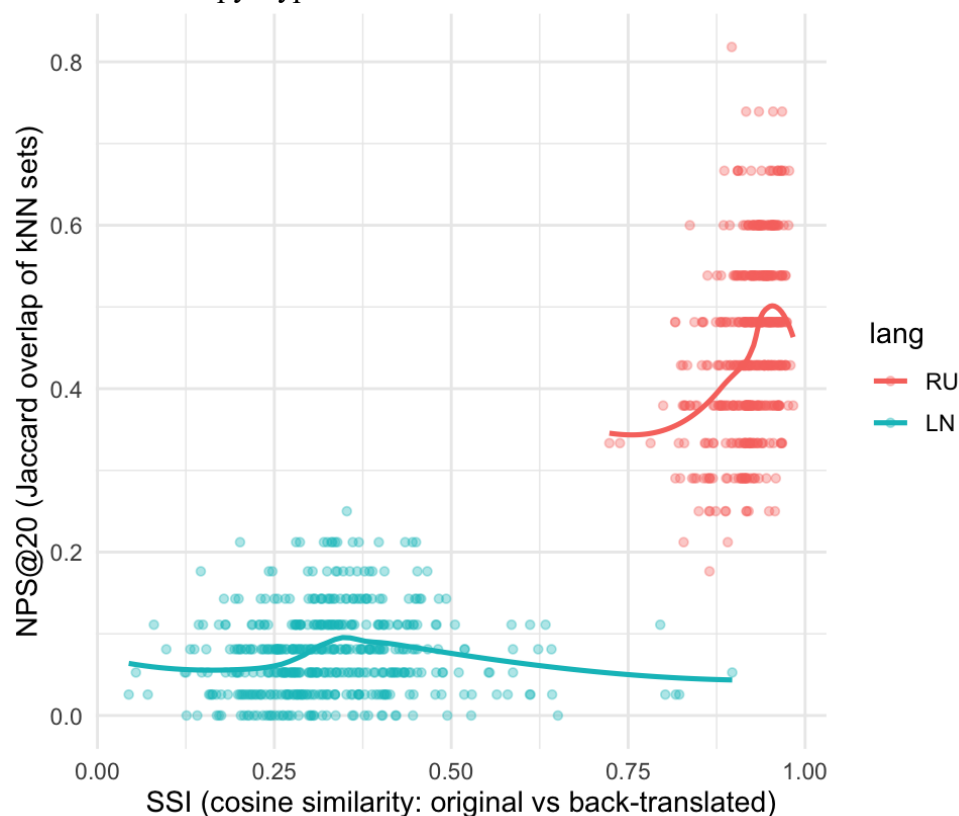
random pairings, Russian texts display higher semantic stability than Lingala texts.

These results indicate that English mediation disproportionately disrupts the relational semantics of low-resource language, fragmenting culturally and contextually grounded meaning structures.

Taken together, SSI and NPS indicate a critical dissociation between local semantic preservation and structural semantic integrity (Figure 4).

Figure 4. Local vs. structural semantic stability by language

Рисунок 4. Локальная и структурная семантическая стабильность по языкам



As Figure 4 clearly shows, for Russian, high SSI coexists with moderate NPS, suggesting that while individual texts remain semantically recognizable, their relative positions within the semantic landscape shift non-trivially. This effect would remain largely invisible under surface-level evaluation metrics. For Lingala, both SSI and NPS are severely degraded, indicating not only loss of semantic content but also a breakdown of culturally coherent semantic organization. This dissociation indicates that English-mediated multilingual processing can preserve apparent meaning while simultaneously reshaping deeper semantic relations, and this effect is considerably more pronounced for low-resource languages.

English-mediated processing does not induce gradual semantic degradation. Instead, it produces a regime shift in semantic stability profiles: high-resource languages retain surface semantic identity while low-resource

languages experience structural semantic collapse.

4.3. Directional Semantic Drift along an Interpretable Axis

Beyond structural instability, we examine whether English mediation induces directional semantic bias along an interpretable moral axis.

We compute axis projections for original and back-translated texts and define axis drift as the difference between these projections. Lingala texts display a small albeit systematic positive drift along this axis (median $\Delta\text{AXIS} \approx 0.036$), whereas Russian texts remain near zero (median $\Delta\text{AXIS} \approx 0.003$). A Wilcoxon rank-sum test confirms a considerable cross-linguistic difference ($p < 2.2e-16$).

It is to be noted that the magnitude of axis drift is not correlated with neighborhood preservation within either language,

indicating that directional semantic bias and structural semantic reorganization constitute distinct effects of English mediation.

4.4. Robustness to Text Length and Segmentation

In order to assess whether the observed effects could be driven by segmentation artifacts or fragment length, we examined the relationship between semantic stability metrics and text length.

Within both languages, correlations between text length and either SSI or NPS are weak ($|\rho| < 0.12$), indicating that variation in document length fail to considerably account for differences in semantic stability. Furthermore, restricting the analysis to the longest quartile of Lingala texts preserves the same qualitative pattern: Lingala remains markedly less stable than Russian in both SSI and NPS.

Together, these findings rule out segmentation conventions and fragment length as primary explanations for the observed cross-linguistic asymmetry.

4.5. Illustrative embedding-level response to English-mediated semantic drift (Lingala)

To improve interpretability, we include a short qualitative example illustrating how the three metrics respond to English-mediated semantic drift.

Original (Lingala):

*nazongaki mboka na ndenge mibale
elingi koloba ngai moko moto nakómaki
lisusu epai na biso mpe nakómaki sikoyo na
likoki ya komipesa na makambo ya nzambe ...
ata na boyangeli ya bakoministe nasengelaki
kokangama na solo mpe kosakola bokonzi ya
nzambe lokola elikya bobele moko mpo na
banyokwami ...*

English-mediated back-translation (Lingala):

*Mi retorné al país de dos maneras,
queriendo decirme a mí mismo que una vez
más había vuelto a nosotros, y ahora estoy en
posición de comprometerme con los asuntos
de Dios ... incluso bajo el liderazgo*

*comunista, tenía que aferrarme a la verdad y
proclamar la soberanía de Dios como la
única esperanza para los oprimidos ...*

While the back-translated version remains fluent and preserves the general narrative structure, a subtle yet systematic shift is observed in the moral framing and agency structure of the text. In particular, expressions of personal commitment and moral obligation are rendered more neutral and report-like, with reduced emphasis on internal resolve and evaluative intensity.

At the embedding level, this transformation is reflected across all three proposed diagnostics. Semantic Self-Similarity (SSI) decreases, indicating reduced within-text semantic recognizability after English mediation. Neighborhood Preservation Score (NPS) also drops, suggesting that the text is repositioned among semantically different neighbors and loses part of its original relational context. Crucially, the text exhibits a directional semantic drift along the moral-evaluative axis, moving toward a more neutral or attenuated region of the space.

This example illustrates how English-mediated processing can preserve surface plausibility while simultaneously reshaping relational meaning and evaluative orientation effects that remain largely invisible to surface-level similarity metrics but are systematically captured by the proposed framework.

5. DISCUSSION

The ongoing study provides a fine-grained analysis of how English-centric processing affects semantic integrity across languages with different resource profiles. Rather than a uniform degradation, we identify two distinct and partially independent mechanisms by means of which English mediation reshapes meaning.

First, English mediation induces structural semantic reorganization, indicated in reduced neighborhood preservation. This effect is present even for a high-resource language such as Russian, where surface semantic similarity remains high.

Consequently, local similarity metrics alone can give a misleading impression of semantic robustness, as they fail to capture changes in relational meaning.

Second, for the low-resource language Lingala, English mediation additionally produces directional semantic bias along an operationally interpretable moral–evaluative dimension. This bias manifests as a systematic axis drift that is absent or negligible in Russian. What is of importance is that this directional shift operates independently of structural instability, suggesting that English mediation can simultaneously reshape semantic topology and nudge texts along specific cultural coordinates.

Together, these findings argue against treating English mediation as a neutral or purely technical intermediate step. Instead, it functions as an active representational filter whose effects depend on the resource status and cultural embedding of the source language.

From a methodological perspective, our results demonstrate the limitations of surface-level evaluation metrics and motivate the inclusion of relational and directional diagnostics when assessing multilingual representations. From a broader perspective, the findings raise concerns about the uncritical deployment of English-centric multilingual models in contexts involving low-resource languages and culturally sensitive content.

Finally, while this study concentrates on translation-mediated probing, the suggested framework naturally extends to the analysis of LLM-generated texts, where English-centric training might induce similar forms of structural drift and directional bias without any explicit translation step.

This study has several **limitations**. First, the use of English-mediated back-translation serves as a diagnostic probe rather than a direct model of real-world text generation. Although this design isolates the effect of English mediation, future work should apply the proposed metrics directly to LLM-generated texts in non-English languages.

Second, the analysis relies on a single interpretable semantic axis with a limited lexicon, chosen for illustrative purposes. While sufficient to demonstrate directional bias, the use of richer interpretable axes, potentially grounded in semantic primitives or mental lexicon frameworks, may strengthen the connection between directional semantic drift and culturally specific meaning structures.

Third, the study focuses on two languages representing contrasting resource profiles. Extending the framework to a broader typological and cultural range of languages would further clarify the generality of the observed mechanisms.

Finally, while embedding-based metrics capture relational semantic structure, they inherit biases from the underlying embedding models. Future work should explore model-specific variability and assess robustness across alternative representation spaces.

Statistical hypothesis testing across metrics (e.g., variance-based analyses) may provide a more fine-grained comparison of robustness profiles across models and languages.

In spite of these limitations, the present study establishes a principled and scalable framework for diagnosing semantic integrity under English-centric processing and opens multiple avenues for investigating multilingual fairness in large language models.

6. CONCLUSIONS

This work demonstrates that English-centric processing induces non-uniform and multi-level semantic effects across languages. By means of separating local semantic preservation from structural semantic stability, we show that high surface similarity fails to guarantee preservation of relational meaning.

Within this framework, cultural semantic integrity should be understood not as a property of a language or a cultural group per se, but as a representational property of multilingual LLM processing. It captures the

extent to which language-specific semantic organizations shaped by shared norms, evaluative distinctions, and usage patterns remain structurally and directionally stable under English-centric mediation. By disentangling surface-level semantic recognizability, relational semantic structure, and directional evaluative bias, the proposed metrics provide an operational and non-essentialist approach to assessing cultural semantic integrity in multilingual representations.

For Russian, English mediation preserves overall semantic recognizability while inducing measurable structural reorganization — an effect that would remain largely invisible under standard evaluation metrics. For Lingala, English mediation results in both structural semantic collapse and a systematic directional bias along a culturally interpretable axis. These effects are robust to text length and segmentation, underscoring their structural nature rather than being artifacts of corpus construction.

Crucially, our analysis reveals that structural reorganization and directional semantic bias operate as distinct mechanisms, rather than as points along a single continuum of degradation. This distinction provides a more nuanced understanding of how English-centric influence manifests in multilingual language models.

Methodologically, the study highlights the limitations of surface-level similarity metrics and motivates the inclusion of relational and directional diagnostics in multilingual evaluation. Substantively, the findings raise concerns about the uncritical use of English-mediated representations in low-resource and culturally sensitive contexts.

While the experiments make use of translation-based probing, the suggested framework naturally extends to the analysis of LLM-generated texts, where similar forms of structural drift and semantic bias may arise with no explicit translation. As such, the approach provides a foundation for future work on fairness, cultural integrity, and semantic reliability in multilingual large language models.

Declarations. We used service <https://wordvice.ai> for English proofreading, including spelling, grammar, and stylistic edits. This service did not generate substantive content or perform any analysis. No generative tool made interpretive or methodological decisions without human oversight, and no confidential or personally identifiable data were shared to third-party services.

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Татьяна Александровна Литвинова, доктор филологических наук, профессор, Воронежский государственный педагогический университет, кафедра русского языка, современной русской и зарубежной литературы, Воронеж, Россия

Tatiana A. Litvinova, Doctor of Philological Sciences (D.Sc. in Philology), professor, Voronezh State Pedagogical University, Department of Russian Language, Modern Russian and Foreign Literature, Voronezh, Russia

Галина Анатольевна Заварзина, доктор филологических наук, заведующий кафедрой, Воронежский государственный педагогический университет, кафедра русского языка, современной русской и зарубежной литературы, Воронеж, Россия

Galina A. Zavarzina, Doctor of Philological Sciences (D.Sc. in Philology), Head of Department, Voronezh State Pedagogical University, Department of Russian Language, Modern Russian and Foreign Literature, Voronezh, Russia

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Elena V. Tikhonova ¹
Daria A. Mezentseva ²

Argument in Academic Writing: A Systematic Scoping Review

¹ MGIMO University,
76 Vernadsky Ave., Moscow, 119454, Russia
E-mail: etikhonova@gmail.com
ORCID: 0000-0001-8252-6150

² Financial University under the Government of the Russian Federation,
49/2 Leningradsky Ave., Moscow, 125167, Russia
E-mail: mezenceva.d@mail.ru
ORCID: 0009-0004-3330-5289

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Abstract:

Background: Argumentative writing represents a core dimension of academic literacy within higher education; however, research concerning “argument,” “argumentation,” and “argumentative writing” remains dispersed across distinct disciplinary paradigms and commonly draws upon non-equivalent conceptual definitions and analytical methodologies. This fragmentation has practical consequences for teaching and assessment, particularly as technology-enhanced writing environments and AI-mediated support expand the range of tools used to scaffold and evaluate argumentation.

Purpose: To map the conceptual and methodological approaches to studying argument in academic writing in higher education, including definitions of argumentative writing, the argument models employed, the ways argument quality is operationalized, the dominant research directions, and the role of digital and AI-mediated environments in the teaching and assessment of argumentation.

Materials and Methods: The review followed PRISMA-ScR guidance and used a PCC framework to define the sources eligibility. A structured search was conducted in Scopus on 27 September 2025 using predefined Boolean queries covering argumentative writing, academic writing, and higher education; backward reference searching was also applied to identify additional relevant studies. Records were screened against inclusion and exclusion criteria, and data were charted in a standardised extraction form. The synthesis combined (a) bibliometric keyword co-occurrence mapping using VOSviewer to identify major thematic blocks and (b) expert thematic coding to interpret conceptualisations, models, and methodological patterns across the literature under analysis. Inter-coder agreement was established during iterative coding.

Results: Ninety-five sources were included in this review. Publication output increased after 2018, with the largest share of studies appearing around 2019–2020, and the evidence base was geographically concentrated in Asia and the Americas. Bibliometric mapping and expert synthesis converged on several recurring blocks: theoretical and definitional work on argument/argumentation in academic writing; pedagogical studies on teaching argumentative writing and related scaffolding; assessment-oriented research (rubrics, indicators of quality, and technology-supported evaluation); sociolinguistic and

interlinguistic perspectives, especially in EFL/L2 contexts; and an emergent strand focused on digital writing environments, automated feedback, and AI-enabled support. Across the corpus, Classical, Toulmin-based, and Rogerian traditions function as influential modelling frameworks, but they are applied inconsistently, and operationalisations of argument quality vary substantially: most commonly privileging detectable structural elements over comparably stable measures of reasoning strength or epistemic integration.

Conclusion: The review shows that the development of research on argumentative writing in higher education is constrained not by a lack of studies, but by the absence of conceptual and methodological coherence. Differences in the definitions of argument, the models used for its analysis, and the approaches to assessing its quality limit the comparability of findings and complicate the translation of research insights into teaching and assessment practice. Under these conditions, the integration of argumentation theories with more robust and substantively oriented approaches to argument assessment becomes particularly important, especially against the backdrop of the growing automation of the structural aspects of writing in digital and AI-mediated environments.

Keywords: Argumentative writing; Academic writing; Higher education; Argumentation; Argument quality; Toulmin model; Rogerian argument; Assessment; Writing pedagogy; EFL writing; Digital writing environments; Artificial intelligence

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Тихонова Е. В.¹
Мезенцева Д. А.²

Аргумент в академическом письме: систематический обзор
предметного поля

¹ МГИМО МИД России
пр-т Вернадского, 76, Москва, 119454, Россия
E-mail: etikhonova@gmail.com
ORCID: 0000-0001-8252-6150

² Финансовый университет при Правительстве РФ
пр-кт Ленинградский, д. 49/2, Москва, 125167, Россия
E-mail: mezenceva.d@mail.ru
ORCID: 0009-0004-3330-5289

*Статья поступила 23 февраля 2026 г.; принята 15 марта 2026 г.;
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Аннотация: Введение. Аргументативное письмо является центральным компонентом академической грамотности в высшем образовании, однако исследования понятий «аргумент», «аргументация» и «аргументативное письмо» остаются разрозненными в рамках различных дисциплинарных традиций и часто опираются на несопоставимые определения и аналитические схемы. Такая фрагментация имеет практические последствия для преподавания и оценивания,

особенно в условиях расширения технологически поддерживаемых сред письма и инструментов с поддержкой искусственного интеллекта, которые используются для сопровождения и оценки аргументации.

Цель. Картировать концептуальные и методологические подходы к изучению аргумента в академическом письме в высшем образовании, включая дефиниции аргументативного письма, используемые модели аргумента, способы операционализации качества аргумента, доминирующие исследовательские направления, а также роль цифровых и AI-опосредованных сред в обучении и оценивании аргументации.

Материалы и методы. Обзор проводился в соответствии с руководством PRISMA-ScR и с использованием рамки PCC для определения критериев включения источников. Структурированный поиск был выполнен в базе данных “Scopus” 27 сентября 2025 г. с применением заранее определённых запросов, охватывающих аргументативное письмо, академическое письмо и высшее образование; также применялся поиск по спискам литературы включённых работ для выявления дополнительных релевантных исследований. Источники отбирались в соответствии с критериями включения и исключения, а данные фиксировались в стандартизированной форме извлечения. Синтез включал: (а) библиометрическое картирование совместной встречаемости ключевых слов с использованием VOSviewer для выявления основных тематических блоков; (b) экспертное тематическое кодирование для интерпретации концептуализаций, моделей и методологических паттернов в отобранной литературе. Согласованность кодирования обеспечивалась в ходе итеративного процесса.

Результаты. В обзор были включены 95 источников. Количество публикаций увеличилось после 2018 г., при этом наибольшая доля исследований приходится на 2019–2020 гг.; географически эмпирическая база преимущественно сосредоточена в Азии и странах Америки. Библиометрическое картирование и экспертный синтез выявили несколько повторяющихся блоков: теоретические и дефиниционные исследования аргумента/аргументации в академическом письме; педагогические исследования обучения аргументативному письму и соответствующих форм сопровождения; работы, ориентированные на оценивание (рубрики, показатели качества и технологии поддерживаемой оценки); социолингвистические и межкультурные перспективы, особенно в контекстах EFL/L2; а также формирующееся направление, связанное с цифровыми средами письма, автоматической обратной связью и поддержкой на основе ИИ. В корпусе исследований классическая традиция, модель Тулмина и модель Роджерса выступают влиятельными рамками моделирования, однако применяются непоследовательно; операционализация качества аргумента существенно варьируется, чаще отдавая приоритет выявляемым структурным элементам по сравнению с более устойчивыми показателями силы рассуждения или эпистемической интеграции.

Заключение. Проведённый обзор показывает, что развитие исследований аргументативного письма в высшем образовании сдерживается не недостатком работ, а отсутствием концептуальной и методологической согласованности. Различия в определениях аргумента, моделях его анализа и способах оценки качества ограничивают сопоставимость результатов и осложняют перенос выводов в практику преподавания и оценивания. В этих условиях особую значимость приобретает интеграция теорий аргументации с более надёжными и содержательно ориентированными подходами к оценке аргумента, особенно на

фоне растущей автоматизации структурных аспектов письма в цифровых и AI-опосредованных средах.

Ключевые слова: Аргументативное письмо; Академическое письмо; Высшее образование; Аргументация; Качество аргумента; Модель Тулмина; Аргумент Роджерса; Оценивание; Педагогика письма; EFL письмо; Цифровые среды письма; Искусственный интеллект

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Introduction

Argumentative writing has become a core component of academic literacy in higher education because it is one of the main textual forms through which students participate in disciplinary discussion and demonstrate reasoned judgement. In institutional settings, it is increasingly treated as a learning outcome precisely because it makes visible how writers justify positions, evaluate competing claims, and work with evidence in a transparent way (Goldman et al., 2016; Ozfidan and Mitchell, 2020; Pei et al., 2017; Sharadgah et al., 2019; Zhang and Zhang, 2021; Kaewneam, 2025). In academic writing, argumentation is realised through adopting a stance on a contestable issue and supporting it with claims, relevant evidence, and explicit reasoning (Rapanta and Macagno, 2019; Yasuda, 2023). At the same time, argumentative writing is not reducible to persuasion, since it also performs an epistemic function when writers use visual (Tikhonova and Mezentsseva, 2025) and linguistic sources to qualify, support, and contest claims, thereby shaping stance and contributing to knowledge building (Ferretti and Fan, 2016; van Weijen et al., 2019; Yasuda, 2023).

Despite this shared educational importance, research on argumentative writing operates with noticeably different understandings of what counts as an argument and how argument quality should be described. Studies often address different aspects of the same phenomenon and then treat their results as comparable, even when the underlying construct focus is not aligned.

This divergence is visible in how quality is operationalised. Structural features of claims and support, dialogic work with counterpositions, and rhetorical organisation across genres are invoked with different emphases and are sometimes treated as interchangeable indicators of competence (Stapleton and Wu, 2015; Yang, 2021; Lu and Swatevacharkul, 2021; Su et al., 2023). As a result, the field has developed a productive vocabulary, but commensurability across studies remains limited, and identical labels can conceal distinct analytical commitments (Ferretti and Fan, 2016; Allen et al., 2019).

Over the past decade, research on argumentative writing has expanded across institutional settings, including higher education, teacher education, multilingual classrooms, and academic literacy programmes, and it has increasingly moved into digitally mediated environments that shape both writing processes and the forms of instructional support available to writers (Newell et al., 2015; Cheong et al., 2021; De Castro Daza et al., 2022). At the same time, a growing body of work has turned to the interactional and evidential labour that academic writers are expected to perform, including anticipating readers' objections, engaging alternative viewpoints, and producing rebuttals grounded in credible sources (Kibler and Hardigree, 2017; Sánchez-Peña and Chapetón, 2018; Hutasuht et al., 2023). These shifts have made differences in constructs and methods more visible and, in practical terms, have raised the stakes of how the field defines what counts as a successful argument in academic writing.

As the number of works on the topic under discussion has increased, conceptual fragmentation has become increasingly apparent. Definitions of argument, argumentation, and argumentative writing diverge across applied domains. Some approaches prioritise reasoning processes and their development (Mulyati and Hadiano, 2023; Hu and Saleem, 2023), others foreground evidence use and rhetorical effectiveness (Shi et al., 2022; Uzun, 2024), and a further strand conceptualises argumentation in dialogic and sociocultural terms (Najjemba and Cronjé, 2020; De Castro Daza et al., 2022). This divergence is also reflected in the use of analytic frameworks. Classical, Toulmin-based, and Rogerian models are frequently cited, yet they are applied in non-equivalent ways, and the boundaries between their functions are not always made explicit (Stapleton and Wu, 2015; Zainuddin and Shammem, 2016). The problem is compounded by locally adapted coding schemes and context-specific instruments which may be well aligned with local educational aims but reduce comparability across studies (Lesterhuis et al., 2018; Paris et al., 2025). In this context, existing reviews have tended to remain restricted in scope and do not fully integrate definitional, methodological, and technology-mediated developments into a single map of the field (Amini Farsani et al., 2025).

Against this background, the task is not simply to compile findings but to reconstruct how the field is organised. This requires clarifying how central concepts are defined, how argument structure and function are modelled, and which recurring patterns shape research trajectories across traditions. The need for such reconstruction has become more acute as automated writing evaluation, argument mining, and AI-assisted writing have expanded and begun to influence both pedagogy and assessment (Wambsganss et al., 2020; Lawrence and Reed, 2020; Guo et al., 2022; Yang et al., 2023; Khampusaen, 2025). Digital environments enable scalable feedback and analytics. One of the

fundamental questions discussed in literature is made more relevant, namely which aspects of argumentation are being supported and which are being measured when support is mediated by tools (Benetos and Bétrancourt, 2020; De Castro Daza et al., 2022). In parallel, cognitive, sociocultural, and multilingual strands continue to propose new typologies of reasoning and new approaches to evaluating argument quality, widening the conceptual space that must be mapped rather than assumed to follow a single developmental pathway (Mateos et al., 2018; Kleemola et al., 2022; Wang and Newell, 2025).

An integrative reconstruction is consequential for three groups of readers. For researchers, it clarifies which constructs and measures can be treated as comparable and where disagreements are better explained by non-equivalent operationalisations than by substantive theoretical conflict. For educators and programme designers, it makes visible what different models privilege in instruction and how those priorities translate into tasks and rubrics, whether the emphasis falls on textual organisation, warranting and evidence-based reasoning, or dialogic engagement with alternative positions (Rapanta and Macagno, 2019; Stapleton and Wu, 2015; Lu and Swatevacharkul, 2021). For scholars working in technology-enhanced writing, the map is necessary for aligning tool affordances with explicit theoretical commitments rather than treating digital support as conceptually neutral (Wambsganss et al., 2020; Lawrence and Reed, 2020; Guo et al., 2022).

In response, the present study conducts a systematic scoping review of research on argument in academic writing in higher education. The review treats argumentative writing as a genre-specific realisation of argumentation that brings together instructional, cognitive, and rhetorical dimensions, providing a coherent basis for mapping conceptual and methodological diversity across the field (Ferretti and Fan, 2016; Allen et al., 2019; Yasuda, 2023). Conceptually, the reconstruction is organised

around four analytic axes, namely definitional choices, model selection, operationalisations of argument quality, and the mediation of instruction and assessment through digital and AI-enabled environments. The analytic stance is integrative and diagnostic. Rather than adopting a single model as a default, the review reads the literature as a set of partially overlapping traditions and examines where they converge, where they diverge, and which tensions persist, particularly in definitions, the use of argument models, and the operationalisation of argument quality (Najjemba and Cronjé, 2020; Shi et al., 2022; Lesterhuis et al., 2018; Paris et al., 2025). This position follows from the interdisciplinary character of the field and recognises that different traditions may capture different aspects of argumentative writing (Musa, 2019; Hutasuhut et al., 2023; De Castro Daza et al., 2022).

To maintain analytical tractability, the review has its eligibility criteria and is bounded to English-language publications from 2015 to 2025 that address higher-education academic writing contexts. These boundaries function as a principled delimitation for reconstructing how argument models, typologies, and quality dimensions are developed and applied within a defined segment of the literature. On this basis, the review addresses the following research questions:

RQ1. How is “argumentative writing” conceptualised in higher-education academic writing research, and which definitional components are treated as constitutive of the phenomenon?

RQ2. Which argument models and analytic frameworks are used to represent argument structure and relations in student academic writing, and how are these frameworks operationalised in empirical studies?

RQ3. How is argument quality operationalised across the field, and which dimensions and indicators are most commonly used in assessment and analysis?

RQ4. Which thematic and methodological patterns organise the mapped literature, including dominant research foci, study designs, and educational contexts?

RQ5. How do digital and AI-mediated environments shape the teaching, scaffolding, and assessment of argumentative writing, and how are technology-enhanced interventions aligned with the underlying argument constructs?

Method¹

Transparency Statement and Protocol

We conducted a scoping review to map the existing literature on argumentative writing in higher education to address the research questions. The review aimed to delineate the scope of the research landscape, identify emerging evidence, and highlight knowledge gaps, thereby contributing to ongoing scholarly discourse and educational policy development. This review adhered strictly to PRISMA-ScR protocol (the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews). Prior to commencing the study, a detailed protocol was developed and established. The authors confirm that this manuscript provides an accurate, thorough, and comprehensive account of the research conducted; it covers all key aspects of the study.

Eligibility Criteria

This scoping review followed a structured methodological framework comprising five key stages: (1) defining the research questions; (2) identifying relevant sources; (3) selecting studies for inclusion; (4) charting and extracting pertinent data; and (5) collating, summarizing, and reporting the results. Inclusion criteria were established using the **PCC** framework as recommended in PRISMA-ScR guidelines. Additional

¹ This section is conceptualised and organized according to the PRISMA-ScR guidelines (Andrea C. Tricco, Erin Lillie, Wasifa Zarin, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med*. 2018;169:467-473. [Epub 4 September 2018]. DOI:[10.7326/M18-0850](https://doi.org/10.7326/M18-0850)).

eligibility restrictions were applied based on language of publication, publication date range, geographical focus/affiliation of the first author or study setting, and document type (Table 1). The review encompassed

various source types, including peer-reviewed journal articles, books, book chapters, conference proceedings/papers, and one unpublished master's thesis.

Table 1. Eligibility Criteria

Таблица 1. Критерии отбора

Criterion	Inclusion	Exclusion	Justification
Population	All the studies describing argumentative writing in academic context, involving university teachers, students, research and scientific staff and educational programmes.	All the studies outside the defined field.	The review focuses on argumentative writing as a component of academic literacy in higher education, ensuring conceptual coherence and comparability across studies.
Concept	Studies that explicitly or implicitly address argumentative writing, including its conceptualisation, structure, functions, assessment, instruction, cognitive processes, or technological mediation.	Studies which do not relate to the concept of argumentative writing.	The aim is to map how argumentative writing and argument are defined, operationalised, and analysed across the research literature.
Context	Academic writing contexts, including higher education, English for Academic Purposes, disciplinary writing instruction, multilingual academic literacy, and digitally mediated academic writing environments.	Studies focusing exclusively on non-academic genres or non-educational contexts.	Restricting the context maintains analytical focus on academic argumentation and supports meaningful synthesis.
Language	English	Any other languages	English functions as the primary language of international scholarly communication and allows consistent data extraction and verification.
Time period	2015-2025	Before 2015	The time frame captures recent theoretical, methodological, and technological developments in

Criterion	Inclusion	Exclusion	Justification
			argumentative writing research.
Types of sources	Scopus, open-source	Non-scholarly or non-open-source sources	Gathering all the available sources possible, ensuring academic quality, transparency, and replicability of the evidence base.
Geographical affiliation	Any location	None	Getting an international perspective.

Information Sources and Search Strategy

The literature search was performed in **Scopus** database. Adherence to the PRISMA-ScR protocol is depicted in the flow diagram (Figure 1). A preliminary search (n = 375 records identified) informed the selection and refinement of search terms and index terms pertinent to argumentative writing in higher education contexts. The final search strategy, incorporating these optimized terms, was run on September 27, 2025. The search terms obtained and refined by consulting relevant publications connected with the topic of interest of this study were combined using Boolean operators (OR, AND or NOT) and truncation symbols. The search entries were the following:

(1)TITLE-ABS-KEY ("argumentative writing" OR "argument writing" OR "written argument*" OR "academic argument*");

(1)TITLE-ABS-KEY ((argument* OR reasoning) AND ("academic writing" OR "university writing" OR "higher education writing"));

(2)TITLE-ABS-KEY (("argumentative writing" OR "written argument*" OR "academic argument*" OR argument*) AND ("academic writing" OR "higher education" OR university OR EAP) NOT (law OR legal OR court OR medical OR clinical OR debate OR speech OR politic* OR "high school" OR K-12));

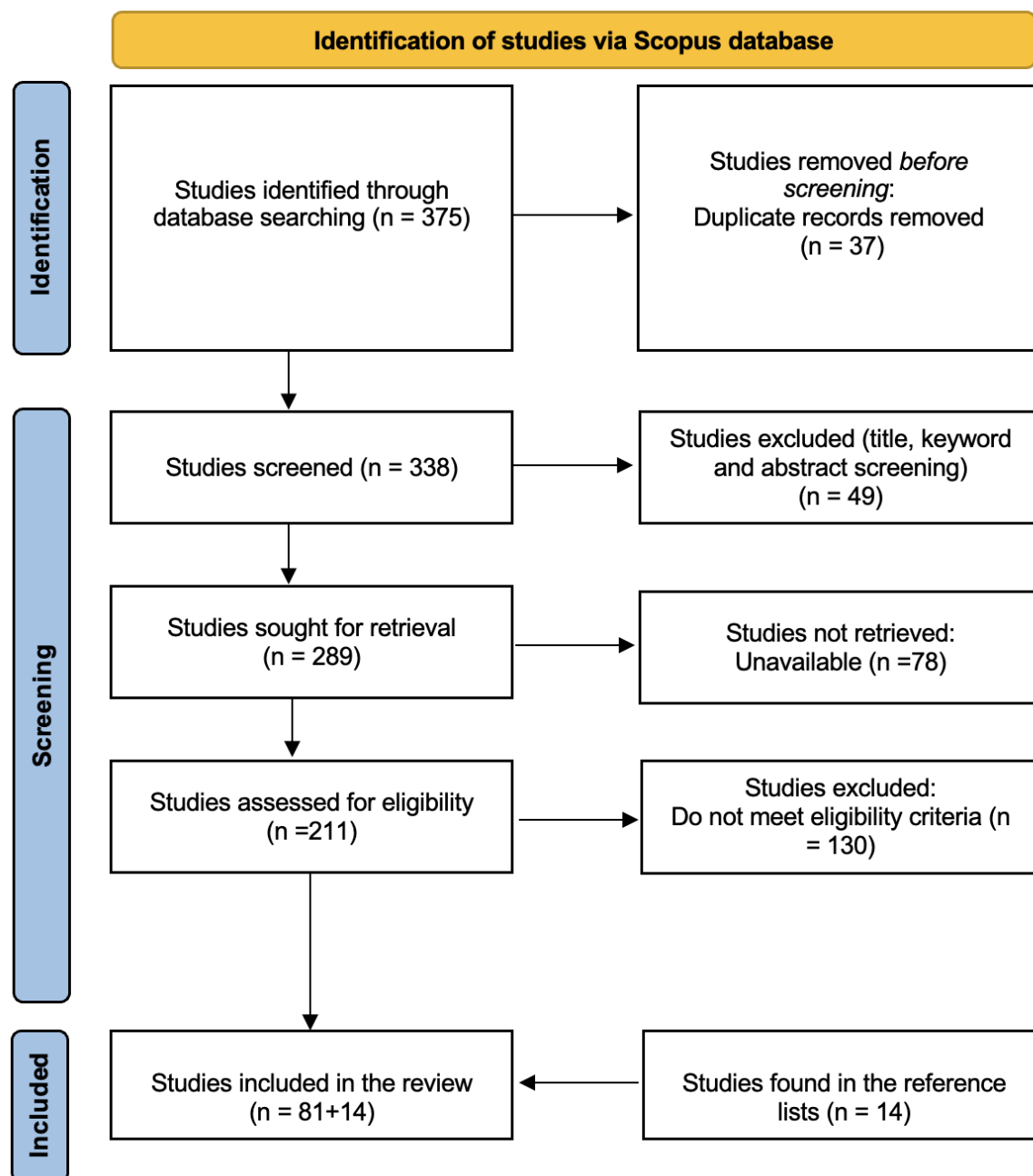
(3)TITLE-ABS-KEY ((argument* AND writing AND (university OR "higher education"))) NOT (debate OR speech OR "oral argument*" OR rhetoric*));

(4)TITLE-ABS-KEY (("argumentative writing" OR argument*) AND ("academic writing" OR university OR "higher education") NOT (primary OR elementary OR "middle school" OR "high school" OR K-12)).

81 studies were found in the Scopus database. Furthermore, the reference lists of the selected studies were examined to identify additional relevant research. From this search, 14 studies were retrieved (as shown in Figure 1).

Figure 1. PRISMA-ScR Protocol

Рисунок 1. Протокол PRISMA-ScR



Selection of Evidence Sources

The references retrieved from the search were imported into a **Zotero** library for organization. Duplicate records were identified and removed using the reference management software's built-in deduplication function. Two independent reviewers screened the deduplicated library in sequential phases: (1) title, keyword, and abstract screening against the predefined inclusion and

exclusion criteria; (2) full-text evaluation of potentially eligible sources. Consensus discussions were held after each phase to resolve any discrepancies regarding eligibility. Persistent disagreements were adjudicated by a third reviewer.

All duplicate records were removed prior to screening. During the title, keyword, and abstract screening stage, 49 sources were excluded as they fell outside the scope of

argumentative writing. Of the remaining 289 sources, 78 were excluded due to unavailability of full text. Full-text review of the 211 accessible sources resulted in the exclusion of 130 that did not meet the inclusion criteria, leaving 81 sources for initial inclusion. An additional 14 relevant sources were identified through backward citation searching (hand-screening of reference lists from included studies). Ultimately, 95 sources were included in this scoping review (see Appendix 1 for the complete list).

Data Charting Process

Data charting was conducted in duplicate and independently by two reviewers, with one reviewer performing initial extraction and the second conducting verification of all entries. Any inconsistencies were resolved via consensus discussions. A pre-defined, standardized Excel-based charting template was used to extract and organize pertinent data from included sources. Charted variables encompassed: author names and institutional affiliations; year of publication; document objectives and summary description; definitions of argumentative writing; argument classification schemes; argument structures/models; research trends in argumentative writing; and considerations of digital contexts and assessment. This methodical process supported a rigorous descriptive synthesis of the evidence in relation to the review's aims.

Summarising and Reporting the Results

Following data charting, the reviewers synthesized findings related to key aspects of “argument” identified in the sources. Given the observed terminological inconsistency during screening, a dedicated analysis of definitions of “argument” and “argumentative writing” was performed to identify shared core characteristics, ultimately informing a consensus operational definition. Definitions were systematically compiled into numbered Microsoft Word documents.

Thematic analysis adhered to the reflexive approach described by Braun and Clarke (2006), involving: familiarization with the data; independent and collaborative code generation and refinement; development of candidate themes; independent application of codes/themes by both coders; and iterative review to achieve consensus. Inter-coder reliability reached >93% agreement on themes, codes, and extracts. Disagreements were resolved via detailed discussion, leading to code/theme adjustments and a confirmatory recoding round. The same structured coding procedure was applied to synthesize evidence on causes and consequences of superfluous verbiage in academic texts, as documented in the reviewed literature.

Results

Demographic Characteristics of the Selected Sources

Publication Years of the Included Sources

An analysis of 95 selected studies reveals a clear developmental trajectory in academic writing research over the past decade (Figure 2). In the early period (2015-2017), publication output was relatively modest, slowly increasing during these years, indicating the consolidation of foundational research themes. This upward trend continued into 2018, suggesting growing scholarly engagement with academic and argumentative writing.

A marked expansion occurred in 2019 and 2020, when the number of studies peaked at twelve per year. This surge reflects intensified interest in cognitive, pedagogical, and technological dimensions of academic writing, including assessment, instructional interventions, and digital tools. Although output declined slightly in 2021, productivity remained consistently high in 2022 and 2023, demonstrating sustained research momentum and diversification of methodological approaches.

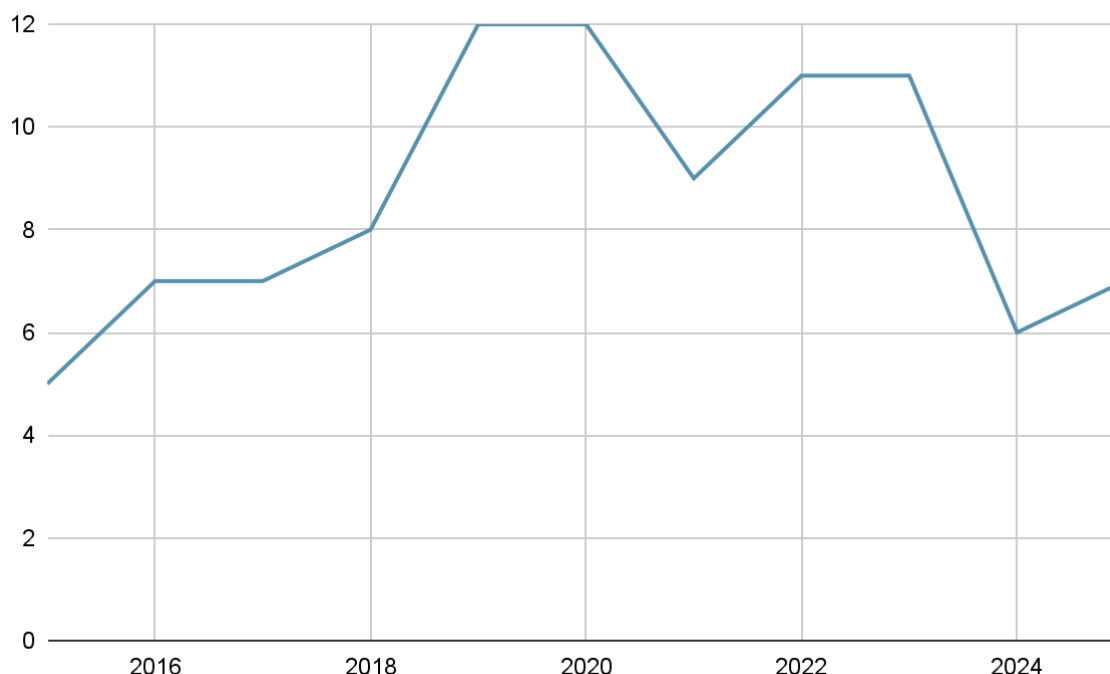
In the most recent years, 2024 recorded six studies and 2025 seven studies. This apparent decrease is best interpreted cautiously, as it may reflect incomplete

indexing and publication delays rather than a substantive reduction in scholarly activity. Overall, the longitudinal pattern suggests that academic writing has evolved into a mature

and stable research field, characterized by strong growth after 2018, a productivity peak around 2019-2020, and continued high-level output in subsequent years.

Figure 2. Yearwise distribution of the sources

Рисунок 2. Распределение источников по годам

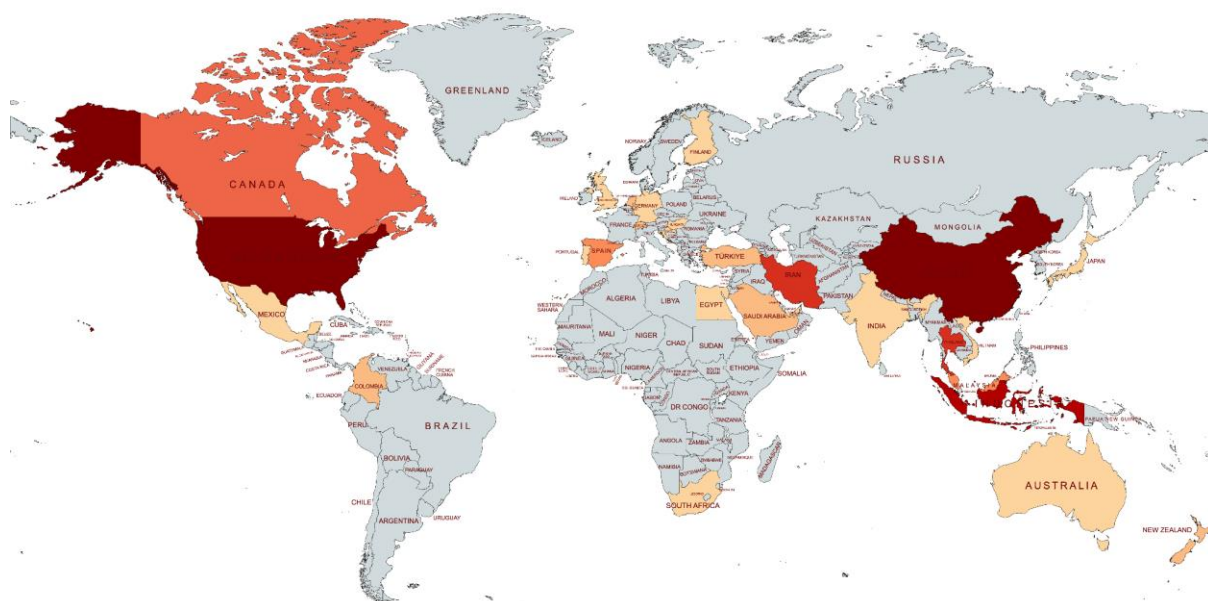


Geographic Affiliation of the Sources' Authors

The geographic distribution (Figure 3) of authors' affiliations of the selected studies, made using MapChat software, shows the density map (dark red represents higher output; light orange shows lower output). The clearest pattern is the dominance of China and the United States, which are tied as the most frequent affiliations (18 studies each). A second tier of contribution is led by Indonesia (10), which appears notably prominent in Southeast Asia. Several countries form a mid-level group, including Iran and Thailand (6

each) and Canada (4), producing visible but less intense shading. Additional contributions are more dispersed: Malaysia and Spain contribute 3 affiliations each, while a set of countries, including the Netherlands, Switzerland, Turkey, Saudi Arabia, Colombia, and New Zealand, appear at 2 affiliations each. Many other countries occur only once, such as Australia, Japan, India, Germany, Finland, Mexico, Portugal, South Africa, Egypt, the UK, the UAE, Vietnam, Belgium, Croatia, and Hungary, which corresponds to very light shading or minimal visibility on the map.

Figure 3. Geographic distribution of the sources
Рисунок 3. Географическое распределение источников



Regionally, the pattern indicates a strong concentration in Asia (53.7% of affiliations), followed by the Americas (26.3%), with Europe (14.7%) contributing across many countries but in smaller, fragmented amounts. Oceania (3.2%) and Africa (2.1%) are comparatively limited. Research activity is concentrated in a few key countries (China and the USA) supported by a smaller but substantial cluster in Southeast Asia, while much of the rest of the world shows scattered, low-frequency contributions to the topic.

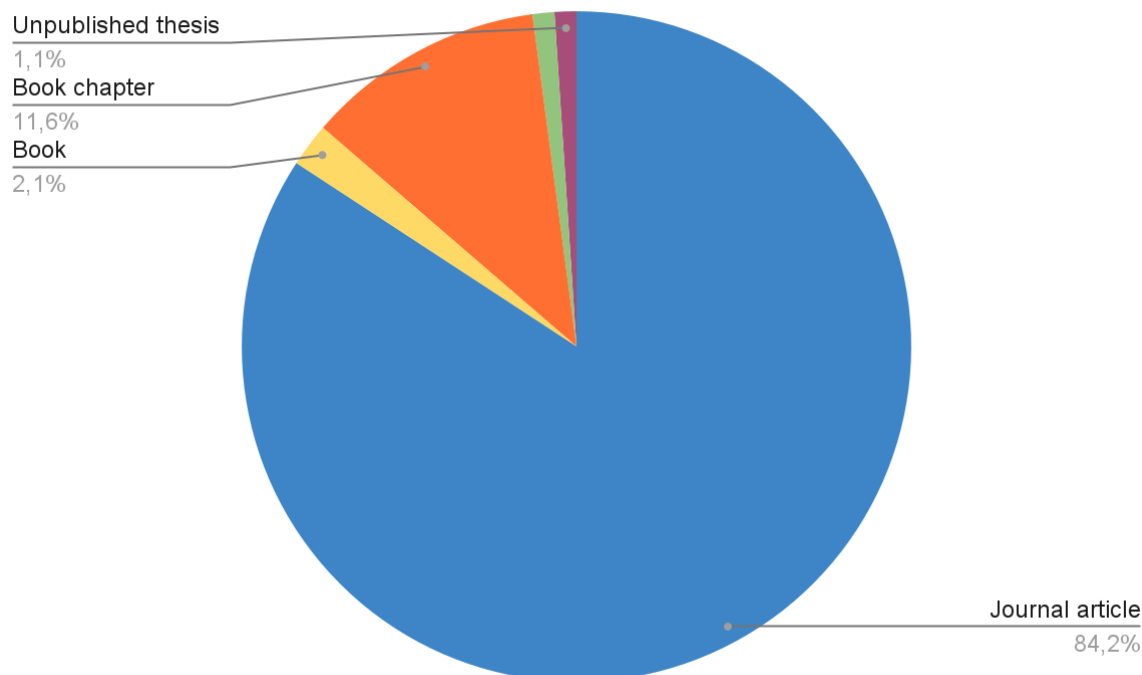
Types of the Selected Sources

An analysis of the publication types in the selected sources shows a strong dominance of journal articles, which account for approximately 84%. This indicates that

research on argumentative writing is primarily disseminated through peer-reviewed journals, reflecting a mature and actively publishing research field. Book chapters are represented by about 12%, suggesting a secondary but still meaningful contribution from edited volumes, typically used for theoretical consolidation, methodological discussion, or pedagogical synthesis. Books are only around 2%, which implies that monographic treatments of argumentative writing are relatively rare compared with article-based dissemination. Only one conference paper (approximately 1%) and one unpublished master's thesis (approximately 1%) are present, indicating that grey literature and preliminary research outputs play a minimal role in this corpus (Figure 4).

Figure 4. Publication types of the sources

Рисунок 4. Типы выбранных источников



The distribution underscores that research on argumentative writing in academic settings relies primarily on journal-based sources, with books and chapters providing supplementary theoretical or pedagogical contributions. This pattern reflects a mature, empirically grounded research area where peer-reviewed articles serve as the central vehicle for knowledge accumulation and dissemination.

Clusters by VosViewer

To obtain an initial overview of the research space, we mapped keyword co-occurrences in the selected corpus using VOSviewer (Figure 5). Each colour represents a separate cluster obtained through modular clustering, based on the frequency with which keywords co-occur in the selected publications. The size of each node

corresponds to the number of times the keyword appears in the corpus, while the thickness of each line indicates the strength of the connection between two terms. Nodes in the centre of the network are more connected to other terms, while those on the periphery are relatively isolated. The software produced 22 clusters, reflecting the thematic dispersion of the literature and the tendency of keywords to form small, locally dense groupings. Because VOSviewer relies on co-occurrence rather than semantic proximity, the resulting structure is informative as a first-pass map but too granular for analytic synthesis. For this reason, we use the VOSviewer output as an exploratory baseline and then consolidate clusters into four higher-order clusters guided by semantic relatedness, shared research tasks, and established classifications in argumentation research (Appendix 2).

Figure 5. Distribution of the clusters based on the co-occurrence network of words in the VosViewer program

Рисунок 5. Распределение кластеров на основе сети совместного появления ключевых слов в программе VOSviewer

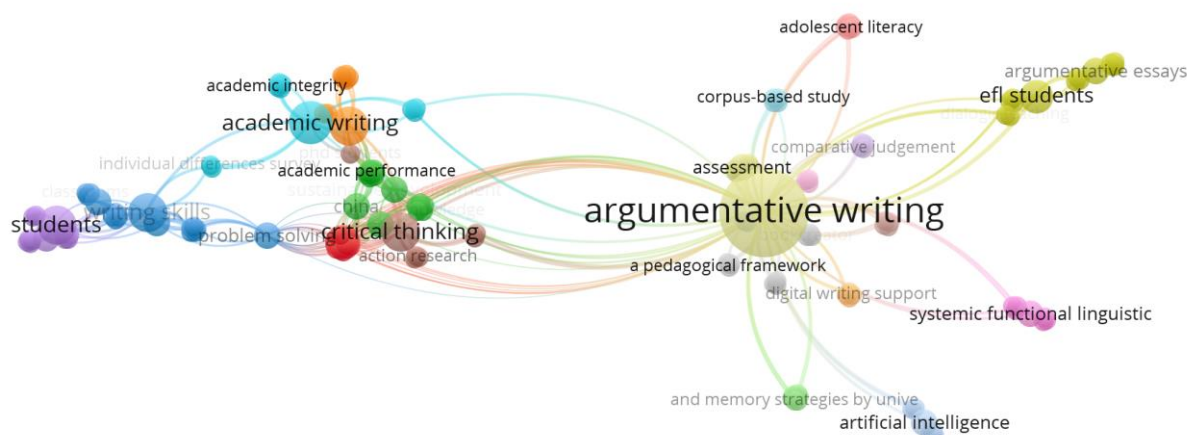


Figure 5 therefore serves as a visual point of departure for the subsequent reconstruction, rather than as an analytic classification in its own right. The dispersion of terms reflects how VOSviewer constructs clusters: keywords are grouped by co-occurrence patterns rather than by semantic proximity or field-specific conceptual relations. This procedure produces a useful exploratory map, but it can also yield an overly fine-grained structure in which conceptually adjacent topics are distributed across multiple small clusters. Accordingly, we do not interpret the 22 clusters as analytic categories. Instead, we consolidate them into four enlarged thematic clusters (Appendix 2). The consolidation is guided by three criteria: semantic proximity of keywords as indicators of a shared research direction, unity of the research task, and consistency with established classifications and typologies in argumentation research. As a result, four conceptually coherent clusters were identified: (1) Theoretical and methodological foundations of argumentation in academic writing; (2) Evaluation and analysis of argumentative writing; (3) Sociolinguistic and interlinguistic aspects; (4) Cognitive-psychological and educational determinants of argumentation.

This approach made it possible to eliminate the excessive fragmentation of automatic clustering and present the structure

of the research field in a more coherent and analytically appropriate form. In the future, these enlarged blocks will be compared with clusters identified manually on the basis of expert analysis of publications with annotations.

Cluster 1. Theoretical and Methodological Foundations of Argumentation in Academic Writing²

This cluster covers studies in which argumentation is viewed as a rhetorical-discursive phenomenon embedded in the system of academic writing and described through the prism of established theoretical and methodological approaches. The key concepts *academic writing* (Ferretti and Fan, 2016; MacArthur and Graham, 2016; Uzun, 2024), *academic integrity* (Goldman et al., 2016; van Weijen et al., 2019; Deane et al., 2019), *Toulmin argument structure* (Ferretti and Fan, 2016; Zainuddin and Shammem, 2016; Rapanta and Macagno, 2019; McCarthy et al., 2022), *argument quality* (Stapleton and Wu, 2015; Lesterhuis et al., 2018; Allen et al., 2019), *argumentation* (Newell et al., 2015; Zhang, L., 2016; Lawrence and Reed, 2020; Yasuda, 2023; Kaewneam, 2025), *critical thinking* (Pei et al., 2017; Sharadgah et al., 2019; Raj et al., 2022; Hu and Saleem, 2023;

² Unites Clusters 6, 7, 8, 9 grouped by the VOSviewer program.

Wang and Newell, 2025), *appraisal theory* (Yang, 2016; Hatipoğlu and Algi, 2018; Papangkorn and Phoocharoensil, 2021), *systemic functional linguistics* (Zhang, X., 2019; Zhang and Zhang, 2021; Uzun, 2024), which indicates the considerable theoretical depth of the field.

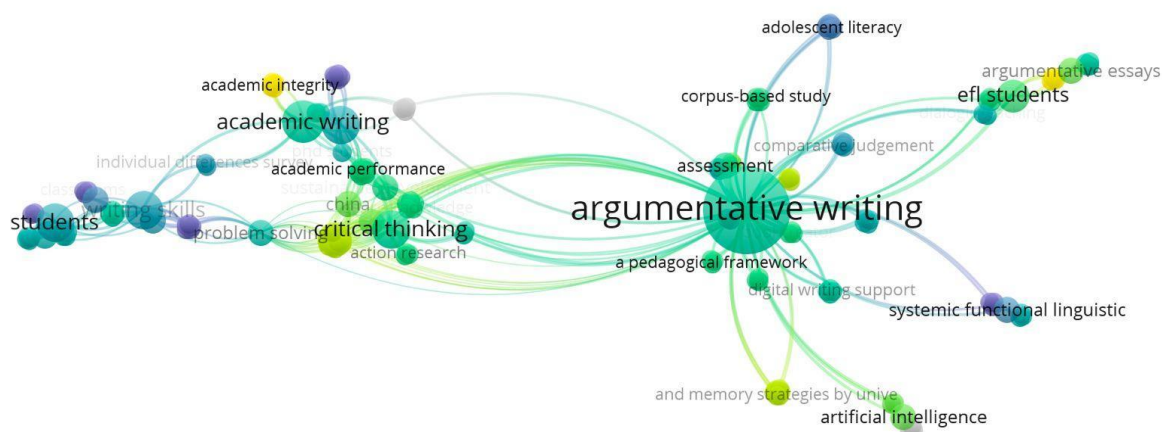
Several sub-areas can be identified within this cluster. The first is related to the adaptation of classical models of argumentation (in particular, Toulmin's structure) to the teaching of written language in an academic context (Newell et al., 2015; Weyand et al., 2018). The second involves the integration of critical thinking and metacognitive strategies into the process of developing argumentative competencies, which is reflected in the active use of the concepts of metacognition and critical thinking (Newell et al., 2015; Mateos et al., 2018; Arroyo González et al., 2020; Lu and Swatevacharkul, 2021). The third is the application of appraisal theory (Martin and White, 2005; Yang, 2016) and systemic functional linguistics (SFL) to analyze the pragmatic and interpersonal functions of

argument in academic texts (Stapleton and Wu, 2015).

To characterise the internal dynamics of Cluster 1, we interpret the VOSviewer research timeline and density maps (Figures 6-7). The color scale in Figure 6 shows the average publication year of the works in which the keyword appears: purple and blue shades indicate earlier studies (2016-2019), light blue and greenish shades indicate the middle period (2020-2022), and yellow and light green shades indicate the most recent studies (2023-2025). The timeline depicts that academic writing, academic integrity, Toulmin-oriented argument structure, and critical thinking constitute a stable conceptual core across the period, with early consolidation visible from 2016-2018. In 2020-2022, the thematic profile broadens to include argument quality, metacognition, and appraisal theory. In 2023-2025, the timeline shows stronger coupling to digitally mediated and intercultural contexts, suggesting that these contexts have become more tightly connected to the established core.

Figure 6. Distribution of research topics on argumentative writing over time (2016-2025) according to VOSviewer visualization data

Рисунок 6. Распределение тем исследований по аргументативному письму по годам (2016-2025 гг.) согласно данным визуализации VOSviewer



The density map (Figure 7) shows high saturation in the same area, indicating sustained attention and frequent co-

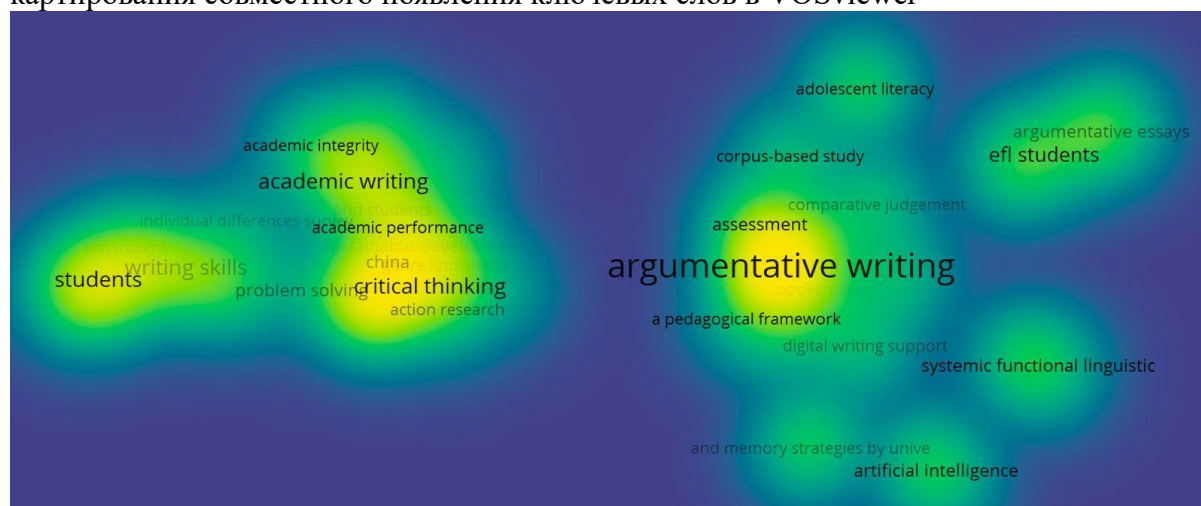
occurrence of the corresponding keywords within the mapped corpus. The colored areas reflect the density of keyword co-occurrence:

the brighter and warmer the color (yellow, light green), the higher the concentration of publications on the topic; areas in cooler shades (blue, purple) indicate a lower frequency of the term in the sample and lower research saturation of the topic. The timeline and density views indicate that, within the mapped corpus, foundational constructs such

as academic writing, Toulmin-oriented structure, and critical thinking form a stable conceptual core, with later years showing stronger coupling to digitally mediated and intercultural contexts. This shift adds new contexts of application and new methodological entry points.

Figure 7. Density of research on argumentative writing topics based on mapping the co-occurrence of keywords in VOSviewer

Рисунок 7. Плотность исследований по темам аргументативного письма на основе картирования совместного появления ключевых слов в VOSviewer



Cluster 2. Assessment and Analysis of Argumentative Writing³

This cluster focuses on developing, validating and applying tools for assessing argumentative writing, and on using digital technologies to support and analyse written texts. Key concepts include *assessment* (Lesterhuis et al., 2018; Rapanta and Macagno, 2019; Deane et al., 2019), *rubric development* (MacArthur et al., 2019; Ozfidan and Mitchell, 2022), *learning outcomes* (Hisgen et al., 2020; Luna et al., 2020; Hu and Saleem, 2023), *comparative judgement* (Stapleton and Wu, 2015; Lesterhuis et al., 2018), *text assessment* (Allen et al., 2019; McCarthy et al., 2022), *validity* (Lesterhuis et al., 2018; Ozfidan and Mitchell, 2022), *digital writing support* (Benetos and Bétrancourt, 2020; Jin et al., 2020; Guo et al., 2022; Shi et

al., 2022), *technology-enhanced learning* (Lam et al., 2018; Latifi et al., 2020; Wambsganss et al., 2020), *corpus-based study* (Allen et al., 2019; Yang J. et al., 2023), *interactional metadiscourse* (Papangkorn and Phoocharoensil, 2021; Al-Otaibi and Hussain, 2024).

Research within this cluster addresses two key objectives. First, it focuses on the development of objective and reliable procedures for assessing argumentative writing (Wambsganss et al., 2020; Cheong et al., 2021), including the design of analytic scoring schemes and rubrics and the empirical examination of their validity and interpretability (e.g., Abdollahzadeh et al., 2017; Deane et al., 2019; Ozfidan and Mitchell, 2022; Stapleton and Wu, 2015). These studies analyse how textual features such as claims, evidence, counter-arguments, and engagement markers are operationalised in assessment criteria and how rater

³ Unites Clusters 13, 14, 15, 16 grouped by the VOSviewer program.

judgements align with theoretical models of argument quality.

Second, this body of research investigates the integration of digital and technology-enhanced tools into both assessment and instruction. This includes the use of corpus-based analysis to examine patterns of support and counter-arguments in learner writing (McCarthy et al., 2022), scenario-based and automated assessment approaches (Deane et al., 2019), and digital authoring and feedback systems designed to scaffold argumentative processes (Benetos and Bétrancourt, 2020; Maharani and Santosa, 2021). More recent studies explore AI-mediated and chatbot-supported writing environments, demonstrating their potential to provide real-time scaffolding, formative feedback, and enhanced learner engagement in argumentative writing tasks (Guo et al., 2022; Guo et al., 2023; Su et al., 2023; Khampusaen, 2025).

Across the mapped studies, technology-mediated support is not distributed uniformly across modelling traditions. Work situated in assessment and analytic coding most often draws on Toulmin-oriented componential logic and is commonly implemented in technology-enhanced formats that foreground structured reasoning and feedback, including blended and gamified designs (Lam et al., 2018; Jin et al., 2020; Wambsganss et al., 2020; Shi et al., 2022; Mulyati and Hadianoto, 2023). By contrast, research discussing digital authoring and online training tends to treat support at the level of general writing environments rather than framing it around Classical arrangement as an explicit model-specific design principle (Benetos and Bétrancourt, 2020; Luna et al., 2020; Maharani and Santosa, 2021). Studies with a dialogic orientation increasingly report AI-mediated and chatbot-supported scaffolding that prompts writers to articulate alternative positions and revise toward more dialogic formulations (Najjemba and Cronjé, 2020; De Castro Daza et al., 2022; Guo et al., 2022; Guo et al., 2023; Su et al., 2023; Khampusaen, 2025).

The early stage (2016-2019) involves *assessment, rubric development, learning outcomes, validity and a corpus-based study*. From 2020 to 2022, the focus shifted to *comparative judgement* and *interactional metadiscourse*. From 2023 to 2024, there is active development of *digital writing support* and *technology-enhanced learning*. This area (centre-right) has one of the highest densities on the heatmap, especially around *argumentative writing* and *assessment*. This reflects the intensive research efforts and inter-cluster connections that make assessment a central element of the field.

Cluster 3. Sociolinguistic and Interlinguistic Aspects of Argumentation⁴

This section covers research examining argumentation in the context of interlingual interference, cultural and linguistic differences, and the specifics of teaching English as a second or foreign language. The key terms identified in this section are *EFL students* (Abdollahzadeh et al., 2017; Tankó and Csizér, 2018; Ghanbari and Salari, 2022; Almashour and Davies, 2023; Mallahi, 2024), *argumentative essays* (Stapleton and Wu (2015; Setyowati et al., 2017; McCarthy et al., 2022; Geng et al., 2024), *second language writing* (Kibler and Hardigree, 2017; Rubiaee et al., 2019; Cheong et al., 2021; Cvikić and Trtanj, 2022), *bilingual advantage* (Hsin and Snow, 2017; van Weijen et al., 2019), *language minority* (Goldman et al., 2016; Ozfidan and Mitchell, 2020; Thompson, 2021), *first language* (van Weijen et al., 2019; Cheong et al., 2021; Cvikić and Trtanj, 2022), *second language* (Hu and Li, 2015; Abdollahzadeh et al., 2017; Hatipoğlu and Algi, 2018; Papangkorn and Phoocharoensil, 2021), *source use behavior* (Kibler and Hardigree, 2017; Cheong et al., 2021; Shi et al., 2022), *dialogic teaching* (Weyand et al., 2018; Musa, 2019; Najjemba and Cronjé, 2020; De Castro Daza et al., 2022), *language*

⁴ Unites Clusters 4, 10, 17 grouped by the VOSviewer program.

development (Hsin and Snow, 2017; Rubiaee et al., 2019; Cheong et al., 2021; Uzun, 2024).

Research in this field has examined how a student's first language and cultural background can influence the structure of arguments in English academic writing (Hatipoğlu and Algi, 2018; Amini Farsani et al., 2025). Important topics include *dialogic teaching* (Su, 2023) and *mediative practices* aimed at developing argumentative skills in bilingual and multilingual students (Mercer and Littleton, 2007). Particular attention is given to the specifics of *source use behaviors* and *academic intertextuality* in second language (L2) writing (Hatipoğlu and Algi, 2018).

Early topics (2016-2019) – *EFL students, argumentative essays, language development, dialogic teaching*. Period 2020-2022 – *source use behavior, bilingual advantage, language minority*. In 2023-2025 – *perspective taking, sociocognitive development*. On the density map, this zone (top right) is less concentrated than Clusters 1 and 2, reflecting greater thematic dispersion and a relatively smaller volume of publications, although within the EFL subgroup the density is higher than in other L2 areas.

Cluster 4. Cognitive-psychological and Educational Determinants of Argumentation⁵

The fourth cluster covers studies in which argumentation in academic writing is analysed through the prism of general cognitive, psychological, and educational factors. Key concepts include *critical thinking disposition* (Zainuddin and Shammem, 2016; Pei et al., 2017; Widyastuti, 2018; Nguyen and Nguyen, 2020; Hu and Saleem, 2023), *cognitive processes* (Klein et al., 2016; Mateos et al., 2018; Lamb, Hand and Yoon, 2019; Allen et al., 2019; Wang and Said, 2024), *self-regulation* (Latifi et al., 2020; Hisgen et al., 2020), *problem solving* (Ferretti

and Fan, 2016; Nesbit et al., 2019; Davies, Barnett and van Gelder, 2021), *academic performance* (Rubiaee et al., 2019; García et al., 2020; Luna et al., 2020; Lu and Swatevacharkul (2021), *motivation* (Lam, Hew and Chiu, 2018; Najjemba and Cronjé, 2020; Hutasuhut et al., 2023), *learning disabilities* (MacArthur et al., 2019; Hisgen et al., 2020), *reading comprehension* (Goldman et al., 2016; Kibler and Hardigree, 2017; van Weijen et al., 2019), *syntax* (MacArthur et al., 2019; Cvikić and Trtanj, 2022), *grammar* (Hu and Li, 2015; Hatipoğlu and Algi, 2018), and *writing skills* (Ferretti and Lewis, 2019; Newell et al., 2015; Setyowati et al., 2017; Mallahi, 2024; Ilyas and Arifin, 2025).

Some studies often go beyond analyzing argumentation as a separate skill, considering it in relation to overall academic literacy, language competence, and cognitive development (Ferretti and Fan, 2016; Goldman et al., 2016; Newell et al., 2015). Within this broader perspective, argumentative writing is conceptualised as a cognitively demanding, literacy-embedded activity that draws on disciplinary reading practices, source integration, and reasoning across texts (Mateos et al., 2018; Cheong et al., 2021; van Weijen et al., 2019). Accordingly, this line of research includes both the study of predictors of successful argumentative writing, such as motivation, metacognitive strategies, problem-solving ability, cognitive flexibility (Nesbit et al., 2019; Allen et al., 2019; Arroyo González et al., 2020; Murtadho, 2021; Almashour and Davies, 2023; Hutasuhut et al., 2023), and the analysis of limitations associated with learners who experience academic or cognitive difficulties, including low-achieving students, basic writers, and those with constrained linguistic or strategic resources (Hisgen et al., 2020; MacArthur et al., 2019; Ozfidan and Mitchell, 2020; Mallahi, 2024; Wang and Said, 2024).

The early stage (2016–2019) is represented by *students, writing skills, reading comprehension, grammar, syntax, critical thinking disposition, and cognitive*

⁵Unites Clusters 1, 2, 3, 5 grouped by the VOSviewer program.

processes. From 2020 to 2022, the focus shifts to *self-regulation*, *problem solving*, *motivation*, *pre-service teachers* and *classrooms*. From 2023 to 2024, *predictive validity* and *cognitive load* research emerge. On the density map, the lower left sector shows a moderate concentration around *students* and *writing skills*, reflecting significant, yet more evenly distributed, interest, without the pronounced peaks that are characteristic of Clusters 1 and 2.

Thematic Clusters by Researchers

The Vosviewer program analysed and grouped all the studies' metadata into 22 clusters. We consolidated these detailed into 4 enlarged thematic clusters: (1) Theoretical and methodological foundations of argumentation in academic writing; (2) Evaluation and analysis of argumentative writing; (3) Sociolinguistic and interlinguistic aspects; (4) Cognitive-psychological and educational determinants of argumentation (Appendix 2).

While the VOSviewer mapping provided a valuable macro-level visualization of keyword co-occurrences and identified four broad metadata-based thematic clusters, it could not fully capture how argument is conceptualized, modelled, taught, and assessed across the reviewed literature. A subsequent full-text qualitative synthesis of the included studies ($n = 95$) therefore enabled a more interpretive and content-sensitive structuring of the field. This analysis produced five analytical clusters: (1) Nature of argumentation; (2) Argumentative writing and its aspects; (3) Models of arguments; (4) Critical thinking as a tool for argumentative writing; and (5) Digitalisation and AI tools for argumentative writing. Together, these clusters provided a more differentiated account of the field than metadata mapping alone.

The qualitative mapping further showed that the studies differ not only in thematic focus, but also in their definitions of argumentative writing, their preferred models

of argument, and the criteria used to operationalize argument quality, including in digitally mediated contexts. Viewed together, these dimensions position argument theory, assessment practices, and technology-enhanced writing support as interconnected rather than isolated strands of research.

Cluster 1. Nature of Argumentation

Argumentation refers to a scholarly form of communication through which writers address controversial questions and manage differing viewpoints in order to move toward reasoned resolution (Van Eemeren and Grootendorst, 2004). It involves taking a position and working to make that position more acceptable to an academic audience (Leitão, 2001) by advancing clearly stated claims supported through evidence and explicit reasoning (Jin et al., 2020). As a textual genre, argumentation is integral to the construction of scientific articles and functions as a key means by which writers participate in, and are initiated into, disciplinary knowledge and its communicative practices (Arroyo González et al., 2020). In doing so, academic argumentation operates as a rhetorical process that relies on structural logic, i.e. presenting opinions, supporting them with facts, and incorporating counteractive moves, while using appropriate tone, voice, and language to convince readers within scholarly debate (Rapanta and Macagno, 2019; Yasuda, 2023).

Argumentation is a rhetorical and communicative practice that is used to address controversial issues and resolve differences of opinion. It involves taking a stance on an issue and defending it within an ongoing dialogue (Van Eemeren and Grootendorst, 2004; Musa, 2019). This is typically achieved by using structural logic to present opinions, support them with facts and incorporate counteractive moves (Ferretti and Fan, 2016; Rapanta and Macagno, 2019; Yasuda, 2023). Argumentation is integral to scientific articles, functioning as a means of conveying disciplinary knowledge and its communicative practices (Arroyo González et al., 2020).

Argumentation is also understood as an attempt at rational persuasion. In this context, writers provide reasons to strengthen or reject an opinion, position, or idea, and demonstrate the truth or untruth of a statement using rhetorical strategies (Mulyati and Hadiano, 2023; Murtadho, 2021). However, developing written argumentation requires additional complexity and control of written conventions, as it is not simply a case of transferring oral arguments into writing (Hsin and Snow, 2017). As argumentation is fundamental to critical thinking and effective participation in society and academia, it is considered a vital lifelong skill and educational objective, helping learners to formulate reasoned opinions and manage increasingly complex knowledge (Tankó and Csizér, 2018; Musa, 2019; Ekalia et al., 2025). High-quality argumentation depends on supporting reasons and evidence; a claim cannot stand alone without justification, otherwise it remains mere opinion. Weaknesses in reasons and evidence may also

reflect limited background knowledge of the topic (Widyastuti, 2018).

Cluster 2. Argumentative Writing and Its Aspects

Across the reviewed sources, “argumentative writing” is defined through different emphases rather than a single shared formulation. Some authors treat it primarily as persuasion and rhetorical influence on the reader (Yang, 2016; Mulyati and Hadiano, 2023; Murtadho, 2021), while others frame it as a cognitively demanding problem-solving activity that involves inquiry, evidence evaluation, and self-regulation (MacArthur and Graham, 2016; Hu and Saleem, 2023; Lee et al., 2022; Pei et al., 2017). Another group places greater weight on dialogic engagement, including refutation, counterargument, and audience responsiveness (Najjemba and Cronjé, 2020; De Castro Daza et al., 2022; Robillos and Art-in, 2023). Table 2 compiles the definitions extracted from the mapped studies and illustrates this variation in construct emphasis.

Table 2. Definitions of argumentative writing

Таблица 2. Определения аргументативного письма

Source	Definition
Al-Otaibi and Hussain, 2024	“an assertive and confident style”
Allen et al., 2019	“a complex cognitive process that is related to the authors’ purpose, the prospects of audiences, the contextual position, and the predictable rhetorical patterns”
Cvikić and Trtanj, 2022	“it presents evidence that proves the author’s claims, which implies logical organization of the text and expression of a cause-and-effect relationship”
Cvikić and Trtanj, 2022	“it presents different points of view with a clearly expressed author’s opinion supported by arguments”
De Castro Daza et al., 2022	“argumentative writing is concerned with broad issues such as the intended audience, how to argue and refute, the use of evidence, logical fallacies, and how to introduce a topic and how to conclude one’s argument”
Ferretti and Fan, 2016	“a mechanism to organize, explore, process, and learn new information”

García et al., 2020; Latifi et al., 2020	“it must contain arguments, namely evidence and reasons that can convince others that the opinions expressed are true”
Hu and Li, 2015	“the ability to qualify one’s statements and express an appropriate degree of certainty and doubt”
Hu and Saleem, 2023	“a “problem-solving” cognitive process”
Lee et al., 2022	“it requires a writer to investigate a topic by collecting, generating, evaluating evidence, and then establish a position on the topic concisely”
Luna et al., 2020	“understanding, managing, and generating arguments and counterarguments from different sources to support a final position, conveyed in a formal structure”
MacArthur and Graham, 2016	“a problem-solving process requiring self-regulation to better achieve the goal of persuasion”
Mulyati and Hadianto, 2023	“a form of rhetoric that seeks to influence the attitudes and opinions of others, so that they believe and ultimately act in accordance with what the author wants”
Murtadho, 2021	“it inspires students to build arguments by carrying out independent investigation into a topic to come up with a collection, generation, and evaluation of evidence to enable them to develop their own stand on the matter”
Murtadho, 2021	“it aims to influence the audience by presenting facts and reasons in such a way that they are believed or accepted”
Najjemba and Cronjé, 2020	“formulating convincing arguments, providing supporting evidence and challenging weaknesses in an opponent’s argument”
Nguyen and Nguyen, 2020	“an argumentative writing must present relevant points with supporting evidence to persuade the readers”
Ozfidan and Mitchell, 2020	“a genre of writing, which establishes a position on an issue or topic, and explains and supports this position with reliable pieces of evidence”
Ozfidan and Mitchell, 2022	“it highlights a position on an issue or topic and describes and supports this position with reliable pieces of evidence”
Papangkorn and Phoocharoensil, 2021	“a major type of non-fiction writing”
Pei et al., 2017	“not only a structural process of words, phrases and sentences but also a complex process that involves grasping the topic, developing the statement, organizing a coherent discourse and putting ideas into writing”
Robillos and Art-in, 2023	“a writing genre that revolves around navigating the space between the content of arguments and the intended audience”
Su et al., 2023	“formulating a clear and logically-sound claim supported by evidence

	and reasoning to persuade others to accept one's position on a topic"
Widyastuti, 2018	"it requires a complex skill involving not only practical but also cognitive and social aspects and thus requires students to have sufficient background knowledge about the issue being written about"
Yang, 2016	"its purpose is to influence and convince readers"
Zhang, 2019	"research evidence rather than random personal thoughts to achieve a persuasive purpose"
Zhang, 2019	"it favors explicit appraisal resources, such as the use of adjectives to show authorial stances and the use of engagement to show the interaction between different voices"

The definitions share a common core but differ in what is treated as decisive, whether stance and persuasion, evidential justification, or interactional positioning among voices (Allen et al., 2019; De Castro Daza et al., 2022; Su et al., 2023). These differences feed directly into later operational choices, including coding schemes, rubrics, and automated indicators used to represent "argument quality" (Stapleton and Wu, 2015; Lu and Swatevacharkul, 2021; Shi et al., 2022).

On the basis of the definitions summarised in Table 2, we derived a set of recurring characteristics that appear across the corpus. The resulting profile covers rhetorical organisation, evidential and inferential work used to justify claims, and dialogic engagement with alternative positions and audience expectations (Allen et al., 2019; De Castro Daza et al., 2022; Najjemba and Cronjé, 2020). Table 3 presents these characteristics together with the sources that motivate each feature.

Table 3. Characteristics of argumentative writing
Таблица 3. Характеристики аргументативного письма

Characteristic	Description	Reference
Controversial focus	Argumentative writing addresses an issue where more than one position is possible, so the topic is framed as something people can reasonably disagree about.	Cvikić and Trtanj, 2022
Clear position-taking	The writer explicitly establishes a standpoint on the issue and maintains that position as the controlling idea of the text.	Ozfidan and Mitchell, 2020, 2022; Su et al., 2023
Persuasive purpose	Its primary goal is to influence readers' beliefs or judgments so they accept the writer's position, rather than merely informing them.	Yang, 2016; Murtadho, 2021; Mulyati and Hadianito, 2023
Justification	The position is supported through explicit reasons and explanations that make the writer's thinking visible and defensible.	García et al., 2020; Latifi et al., 2020
Evidence-based	Argumentative writing relies on evidence that	Zhang, 2019; Nguyen

support	is relevant, not random personal opinion, and uses it to substantiate reasons and claims.	and Nguyen, 2020; Ozfidan and Mitchell, 2020, 2022; Su et al., 2023
Explicit reasoning links	Beyond presenting evidence, writers explain how and why the evidence supports the claim, creating a cohesive chain from questions to claims to evidence.	Lamb et al., 2019; Jin et al., 2020; Su et al., 2023
Dialogical engagement	A strong argumentative text represents alternative perspectives instead of presenting only one voice, showing awareness that opposing views exist.	Lu and Swatevacharkul, 2021; Cvikić and Trtanj, 2022
Counterargument	It does not stop at mentioning opposing views; it responds by challenging weaknesses, refuting points, or rebutting with stronger reasoning or evidence.	(Lu and Swatevacharkul, 2021; Najjemba and Cronjé, 2020; Su et al., 2023).
	More “critical” argumentation integrates valid counterarguments and uses accurate evidence.	Rapanta and Macagno, 2019
Audience awareness and adaptation	Writers anticipate readers’ expectations and likely objections and choose content and strategies accordingly.	Allen et al., 2019; De Castro Daza et al., 2022; Robillos and Art-in, 2023
Conventional genre structure and coherence	It commonly follows a recognizable structure (introduction, claim, supporting points, counterargument/rebuttal, conclusion) and uses logical organization and cohesive links to guide the reader.	Yang, 2021; Lu and Swatevacharkul, 2021; Papangkorn and Phoocharoensil, 2021; Cvikić and Trtanj, 2022
Degree of certainty	Writers project an appropriately confident academic voice while also qualifying claims when necessary (hedging, cautious language) to match the strength of evidence. Stance and engagement resources help manage interaction among voices.	Hu and Li, 2015; Zhang, 2019; Al-Otaibi and Hussain, 2024
Investigative and problem-solving process	Argumentative writing often involves inquiry (collecting, generating, and evaluating evidence) and is described as a complex, problem-solving cognitive activity requiring planning and self-regulation.	Lee et al., 2022; Murtadho, 2021; Hu and Saleem, 2023; MacArthur and Graham, 2016; Pei et al., 2017

The profile in Table 3 indicates that argumentative writing is treated as a composite construct. Studies that use similar

labels may therefore rely on different combinations of structural, reasoning-based, and dialogic criteria, which reduces

comparability unless operational definitions are made explicit (Stapleton and Wu, 2015; Shi et al., 2022; Rapanta and Macagno, 2019).

Culture and Language Related Aspects in Argumentative Writing

Argumentative writing places heavy cognitive and rhetorical demands on writers even in the first language. To produce an effective argumentative paragraph, writers must choose among metadiscourse resources and use them in a controlled way to manage stance, guide the reader, and sustain a coherent line of reasoning (Hatipoglu and Algi, 2018). In a second or foreign language, these demands intensify. L2 writers often have a narrower repertoire of metadiscourse markers and may be less confident in expressing nuance or calibrating engagement. Under such constraints, novice writers may fall back on familiar routines and transfer preferred patterns from L1 into L2 texts (Hatipoglu and Algi, 2018).

Argumentative performance is shaped not only by individual linguistic resources but also by cultural and cross-linguistic genre conventions. Genres develop within educational and rhetorical traditions, and their typical expectations can differ across languages and cultures (Graham and Rijlaarsdam, 2016). At the same time, the degree of divergence appears to depend partly on how closely related the languages are (van Weijen et al., 2019). In practical terms, this means that conventions for stating claims, signalling certainty, and incorporating opposing views may not align across contexts, and multilingual writers must learn to adjust their argumentative choices to unfamiliar norms.

These issues become especially visible in source-based argumentative writing. Here, success depends on more than general writing ability and L2 proficiency. Students must acquire practices in at least two domains: argumentation and reasoning, and the use of sources as evidence, including selection, integration, evaluation, and attribution in ways that meet academic conventions (Ferretti and Fan, 2016; van Weijen et al.,

2019; Arroyo González et al., 2020). The task therefore requires students to construct justified claims while also building an evidential chain that is transparent to the reader and defensible within scholarly norms.

Cross-language research further suggests that some aspects of writers' argumentative behaviour may be relatively stable across languages. Van Weijen et al. (2019), for example, report that writers may reproduce similar surface features across tasks in different languages, including the use of titles or reference lists, which points to transfer across writing contexts. At the same time, composing in an L2 can prompt simplification in argumentative design. In L2 settings, writers may rely more heavily on a canonical structure that foregrounds source-based support for a single position while leaving limited space for counterarguments and rebuttals (van Weijen et al., 2019). Such patterns reduce dialogic depth and can weaken the appearance of engagement with alternative perspectives, a dimension often valued in academic argumentation.

For students whose first language is not English, an additional difficulty lies in expressing positions accurately and appropriately within English academic discourse (Amini Farsani et al., 2025). Together with cultural and rhetorical differences, this helps explain why reasoning and argument quality are frequently reported as problematic in L2 contexts. Cheong et al. (2021) emphasise that sustained, reasonable argumentation is demanding even in L1 and becomes more difficult in an L2, where limitations in linguistic resources can constrain reasoning performance. Empirical work likewise indicates that L2 academic writing often shows weaker reasoning than expected for higher education study (Cheong et al., 2021), and difficulties with argumentation are reported not only for L2 writers but also for many L1 writers, with L2 learners often facing persistent challenges across their programmes (Tanko and Csizer, 2018). These findings point to the need for instruction that goes beyond accuracy. It must

address metadiscourse control, shifting genre expectations, cross-cultural rhetorical norms, and the reasoning and source-use practices on which academic argumentation depends.

Teaching Argumentative Writing

Argumentative competence is widely treated as a core condition of academic development because it enables students to articulate a position, evaluate claims, detect weak reasoning, and negotiate competing viewpoints through counterarguments and rebuttals (Cheong et al., 2021; Sánchez-Peña and Chapetón, 2018; Kaewneam, 2025). Written argumentation presupposes an intellectual exchange between writer and reader in which alternative perspectives are interpreted, weighed, and addressed through reasoned responses (Sánchez-Peña and Chapetón, 2018). Beyond academic performance, sustained work in this genre is associated with problem solving and independent critical thinking, capacities that support informed participation in social life (Hisgen et al., 2020; Akib et al., 2024). Argumentative writing can also strengthen students' academic agency by requiring them to locate credible sources and to summarise and synthesise evidence in support of an explicitly justified stance (Thompson, 2021). For second language learners, this form of literacy often functions as a fundamental, helping them align emerging academic skills with the argumentative practices of academic discourse communities (Amini Farsani et al., 2025).

At the same time, argumentative writing places heavy cognitive demands on learners because it requires coordination of language resources, reasoning, and topic knowledge. These demands become particularly salient in EFL contexts (Liu et al., 2023; Ekalia et al., 2025). When students lack awareness of what constitutes effective writing, the quality of their argumentative texts tends to deteriorate, even when they possess relevant ideas (Rubiaee et al., 2019). Novice writers often face additional constraints. They may enter higher education with limited guidance in argumentation, their prior educational

experiences may not match university expectations, and many hesitate to take a clear position or rely on a one-sided understanding of argument that leaves little room for alternative perspectives (Kleemola et al., 2022). In empirical accounts, written argumentation is often described as slow to develop, with student drafts frequently exhibiting weak quality and difficulty in producing strong arguments (Allen et al., 2019). Recurrent shortcomings include weak evaluative standards, limited supporting proof, and underdeveloped engagement with counterarguments, which together point to the need for targeted instructional support (Ferretti and Lewis, 2019). More generally, younger or less experienced writers tend to find argumentative writing more challenging than narrative writing, consistent with the view that argumentation is an intellectually demanding problem (van Weijen et al., 2019; Ferretti and Fan, 2016).

Instructional expectations in academic argumentation centre on position taking supported by credible evidence. In many higher education writing tasks, students are required to adopt a stance and justify it through research drawn from reliable sources (Setyowati et al., 2017). Evidence use involves more than citation; it requires selecting information that can plausibly validate an argument and making its relevance explicit (Kibler and Hardigree, 2017). This is the point at which warranting becomes critical. Students must not only present data but also establish why that data is significant and sufficient for the claim at hand (Weyand et al., 2018). Source based argumentative writing adds further complexity because writers must build a coherent argument from reading or listening materials while simultaneously analysing and evaluating content knowledge (Cheong et al., 2021). In addition, instruction must incorporate academic integrity and credibility. Learners need guidance in strengthening claims with authoritative sources and in treating citation practices as ethical scholarly behaviour rather than mechanical formatting (Uzun, 2024).

Learners' difficulties are often visible in a recurrent set of problem areas. Students may struggle to formulate a defensible thesis, organise ideas coherently, provide sufficient and appropriate evidence, and address counterarguments with adequate reasoning. Difficulties also arise at the level of writing process, including planning, revision, time management, and control of mechanics (Almashour and Davies, 2023). In EFL research, cognitive challenges are frequently

grouped into limited command of argument structure, weak critical thinking, and insufficient feedback conditions (Wang and Said, 2024). Against this background, strategy instruction is discussed as a practical mechanism for supporting task understanding, idea organisation, and development of coherent argumentation (Almashour and Davies, 2023). Table 4 summarises strategy categories that recur in the literature and illustrates how they translate into concrete classroom practices.

Table 4. Cognitive strategies for argumentative writing tasks⁶

Таблица 4. Когнитивные стратегии заданий по аргументативному письму

Strategy	Description	Examples
Planning and organizing	Students use planning and organizational strategies to manage their time and resources and to structure their writing.	developing outlines, mind maps, or graphic organizers to help organize their ideas
Monitoring	Students use monitoring strategies to check their work and evaluate their progress.	reviewing their writing for grammar, syntax, and spelling errors, as well as checking their argument for coherence and logical consistency
Elaboration	Students use elaboration strategies to expand their thinking and make their writing more complex and nuanced.	analogies or examples to explain their arguments or to provide supporting evidence
Self-regulation	Students use self-regulation strategies to control their learning and behavior.	setting goals, monitoring their progress, and adjusting their strategies as needed
Visualization	Students use visualization strategies to remember and understand the material more effectively.	creating mental images of concepts, ideas, and arguments.
Critical thinking	Students use critical thinking strategies to analyze and evaluate arguments and evidence.	identifying biases, fallacies, or weaknesses in the argument and weighing the evidence to make a well-supported claim

⁶ Based on the information from Almashour, M. and Davies, A. (2023). Exploring learning strategies used by Jordanian University EFL learners in argumentative writing tasks: The role of gender and proficiency. *Frontiers in Education*, 8. <https://doi.org/10.3389/feduc.2023.1237719>

The strategy categories in Table 4 clarify why effective teaching cannot be reduced to a generic template. Planning and monitoring support structural control and coherence, elaboration strengthens evidential development, and critical evaluation targets the quality of reasoning. In EFL settings, where cognitive load is typically higher, these supports become central rather than auxiliary (Liu et al., 2023; Wang and Said, 2024).

Teaching practices therefore need to be explicit, strategic, and responsive to students' academic histories. Higher education students arrive with uneven exposure to argumentation, yet they are expected to construct arguments that take multiple positions into account (Robillos and Art-in, 2023). Research links effective instruction with explicit modelling and scaffolded practice, especially when the aim is to develop reasoning depth rather than formulaic responses. This also requires adaptive teaching expertise, namely flexible knowledge of strategies that can be adjusted to learners with different educational trajectories (Athanasios et al., 2015; Newell et al., 2017). Counterargumentation is frequently underdeveloped, and several authors therefore recommend teaching counterargument explicitly so that students do not default to arguing against a source text without analytical engagement (Cheong et al., 2021). Instruction also benefits from direct work with warrants, backings, and coherent sequencing of argument components (Lesterhuis et al., 2018). In addition, familiarising students with relational claim types and practising support appropriate to those claim types may broaden rhetorical repertoires and lead to greater variation in essay structures (Tankó and Csizér, 2018).

Different orientations toward evidence use and warranting have been described as shaping instructional priorities. Weyand et al. (2018) distinguish three argumentative epistemologies. A structural approach treats argument construction as application of rules that yield a predetermined structure (De La Paz et al., 2012, as cited in Weyand et al.,

2018). An ideational approach frames evidence-based writing as a means of developing, organising, and presenting ideas (Langer and Applebee, 1987, as cited in Weyand et al., 2018). A social process approach emphasises purpose driven argumentation situated in social contexts (Ivanič, 2004, as cited in Weyand et al., 2018). This distinction helps explain why teaching cannot be limited to naming "parts" of an argument. It must also address what arguments are for, how evidence functions in context, and how writers anticipate readers' perspectives.

Tools and assessment practices can support teaching, although they may also narrow what is attended to if they are used as substitutes for instruction rather than as supports. Argument mapping is often presented as a useful aid in source-based tasks, particularly when students must work with diverse materials under time constraints. Mapping can help learners organise information, clarify perspective space, and make inferential relations explicit (Robillos and Art-in, 2023; Robillos and Thongpai, 2022; Davies et al., 2021). Automated writing evaluation is discussed in a similar enabling register. Content focused AWE feedback may support baseline knowledge about evidence use, including what constitutes a complete argument and how sources and reasons can be incorporated. At the same time, more advanced judgements about evidence relevance and persuasiveness appear to depend on collaborative work and guided interpretation rather than automation alone (Shi et al., 2022). Several authors therefore caution against evaluating written argumentation solely by counting argument elements, because such procedures can mask deficits in reasoning quality and responsiveness to alternative positions (Cheong et al., 2021). The complexity of argumentative reasoning and the difficulty of assessing it transparently may partly explain why argumentation remains underrepresented as a teaching tool in many academic writing

handbooks and courses (Rapanta and Macagno, 2019).

Teaching argumentative writing therefore involves more than improving language accuracy or enforcing a standard form. It requires sustained support for responsible position taking, credible evidence use, explicit warranting, and engagement with alternative viewpoints through modelling, scaffolded practice, and feedback that targets both structure and reasoning depth (Cheong et al., 2021; Lesterhuis et al., 2018; Wang and Said, 2024). When these conditions are met, argument writing instruction can contribute not only to stronger academic performance but also to broader capacities for critical participation, including source evaluation and evidence-based judgement (Hisgen et al., 2020; Thompson, 2021).

Assessment of Argumentative Writing Skills

Argumentative writing is among the most frequently used genres in classroom writing practice and formal writing assessment. In authentic academic settings, producing an argumentative text typically

requires writers to evaluate, select, and use content knowledge from sources, rather than relying on personal opinion alone (Cheong et al., 2021). Persuasiveness therefore depends on whether claims are supported by an adequate evidential basis and on whether the text makes the reasoning that links evidence to claims explicit. For this reason, the assessment of argumentative writing cannot be reduced to general language accuracy. It must address evidence use and justificatory reasoning as core dimensions of performance (Paris et al., 2025).

In accountability settings, assessments of written argument are commonly organised into three broad formats: selected response tests, constructed response tasks, and projects or portfolios (Deane et al., 2018). These formats differ in the kind of evidence they provide about argumentative competence and in how confidently a score can be interpreted as reflecting students' ability to produce extended argumentation. Table 5 summarises the three formats and the principal interpretive constraints associated with each.

Table 5. Assessments of written argument⁷

Таблица 5. Оценка письменного аргумента

Category	Description
Selected-response tests	pose specific problems and ask students to choose the best solution(s) from a list of options. Items cover a range of skills, extending from writing fundamentals (e.g., grammar, syntax, and sentence structure) to argument quality. These assessments can gather evidence about a variety of elemental skills relatively quickly, but they do not exercise critical aspects of written argument or other advanced literacy skills, specifically the ability to integrate and manage the multiple competencies necessary to produce effective arguments.
Constructed-response assessments	require students to respond to a short prompt in a fixed time, as in the National Assessment of Educational Progress (NAEP) and other standardized tests, support the evaluation of integrated, holistic performance. In typical implementations, though, students

⁷ Based on the information from Deane, P., Song, Y., van Rijn, P., O'Reilly, T., Fowles, M., Bennett, R., Sabatini, J. and Zhang, M. (2019). The case for scenario-based assessment of written argumentation. *Reading and Writing*, 32(6), 1575–1606. <https://doi.org/10.1007/s11145-018-9852-7>

	have little time to develop their understanding of the topic, and only the performance product is measured, not the processes and components that contribute to it. It may be hard to determine what a low score on an argument performance assessment implies about students' ability to generate arguments, analyze positions, claims, or supporting evidence, or comprehend source texts.
Projects and portfolios	closely resemble (or directly record) work done in school or professional settings. Sources must be read, the arguments of others summarized, analyzed, and critiqued; a position developed, and one's argument expressed using evidence from sources. The challenge from an accountability assessment perspective is in the cost, time, logistics, and complexity of interpreting such measures.

As Table 5 indicates, the three formats vary in what they can capture. Selected response tasks can efficiently sample knowledge about argument features, whereas constructed responses and portfolio-based work provide stronger evidence of how students coordinate claims, evidence, counterpositions, and rebuttals in extended writing. This distinction becomes consequential in high stakes assessment contexts, where argumentative performance is used to support decisions about students' readiness for academic work and progress within programmes (Zhang and Zhang, 2021).

Because argument quality is difficult to evaluate in a transparent and defensible way, particularly in foreign language settings, assessment practice depends on clearly specified criteria. In writing assessment, well designed rubrics are therefore essential, because they articulate the criteria by which performance is judged and help separate language control from the quality of argumentation (Ozfidan and Mitchell, 2022; Paris et al., 2025). At the same time, rubric design makes visible a central difficulty in the field. Studies suggest that students may produce texts containing numerous formal argument elements while still demonstrating weak reasoning. Abdollahzadeh et al. (2017), for example, report that the frequency of argument components can be relatively high

even when reasoning quality remains limited. This implies that assessment should not rely on counting elements alone, but should adopt integrative criteria that attend to relevance, justification, and engagement with alternative viewpoints as part of audience-oriented persuasion (Abdollahzadeh et al., 2017; Paris et al., 2025).

One response to this challenge is to combine structural and reasoning focused criteria within analytic scoring. Stapleton and Wu (2015) propose the Analytic Scoring Rubric for Argumentative Writing, which integrates evaluation of structural components with judgement of reasoning quality. Rubrics of this kind are designed to distinguish the superficial presence of argumentative elements from deeper competence in justification, relevance, and responsiveness to counterpositions, thereby strengthening the interpretability of assessment outcomes (Stapleton and Wu, 2015; Abdollahzadeh et al., 2017).

Alongside human scoring, technology is increasingly discussed as a means of expanding feedback capacity. Automated systems can, in principle, support learners by providing argumentation focused feedback that is less constrained by instructor availability and can be integrated into iterative revision cycles (Wambsganss et al., 2020). Such feedback becomes particularly

relevant when instructional aims prioritise improvement in evidence use, justificatory reasoning, and engagement with counterarguments, which rubrics and classroom assessments are intended to capture.

Assessment is also closely tied to instruction. Writing programmes and writing across the curriculum initiatives are encouraged to provide sustained opportunities for students to participate in argumentative practices in which they evaluate claims, justify positions, attend to contradictory views, and develop counterarguments and rebuttals (Abdollahzadeh et al., 2017). In this sense, assessment functions not only as measurement, but also as a mechanism that shapes what kinds of evidence-based reasoning students learn to produce in academic contexts.

Cluster 3. Models of Arguments

Argumentation has long been recognised as a central component of academic writing; however, it is not a unitary or universally defined construct. Across disciplines and research traditions, scholars have proposed diverse models of argument that emphasise different structural, rhetorical, cognitive, and social dimensions of argumentative practice (e.g., Toulmin, 1958; Rogers, 1961; Sanchez-Peña and Chapeton, 2018; Mateos et al., 2018; Musa, 2019). These models range from formal and logical representations of claims, evidence, and warrants to dialogic, genre-based, and socio-cognitive approaches that foreground audience engagement, stance construction, and contextual meaning-making (Stapleton and Wu, 2015; Zhang and Zhang, 2021; Geng et al., 2024). As a result, the field is characterised by conceptual plurality rather than theoretical consensus.

Within the mapped corpus, Toulmin based approaches are most frequently operationalised explicitly, particularly in studies focused on assessment, analytic coding of argument structure, and technology

mediated writing support (Stapleton and Wu, 2015; Zainuddin and Shammem, 2016; Lu and Swatevacharkul, 2021). Classical rhetorical organisation is less often presented as an explicit model, yet it informs conventional essay structuring and is reflected in rubric based instructional contexts (Zhang, 2016; Ozfidan and Mitchell, 2022; Zhang and Zhang, 2021). Rogerian oriented principles appear mainly in studies adopting dialogic and sociocultural perspectives, especially where collaborative writing, perspective taking, and audience responsiveness are foregrounded (Musa, 2019; Hutasuht et al., 2023; Najjemba and Cronje, 2020; De Castro Daza et al., 2022).

Models of argumentation are fundamental to argumentative writing because they offer structured representations of how reasoning is organised, communicated, and evaluated in academic discourse. By making explicit the components of argument and the relationships among claims, evidence, and justification, argument models enable systematic analysis of argumentative texts and provide analytical lenses for examining argument quality across contexts (Stapleton and Wu, 2015; Deane et al., 2019; McCarthy et al., 2022). From a research perspective, these models function as frameworks for describing and comparing argumentative performance across genres, disciplines, proficiency levels, and linguistic backgrounds (Abdollahzadeh et al., 2017; Cheong et al., 2021; van Weijen et al., 2019). In pedagogical contexts, argumentation models operate as cognitive and instructional scaffolds that support writers in externalising complex reasoning processes, anticipating alternative viewpoints, and aligning their texts with disciplinary expectations (Ferretti and Lewis, 2019; Luna et al., 2020; Lu and Swatevacharkul, 2021). Empirical studies further indicate that model-based instruction can enhance learners' reasoning quality, evidence integration, and critical thinking in argumentative writing (Zainuddin and

Shammem, 2016; Mateos et al., 2018; Kaewneam, 2025).

Importantly, different models foreground complementary dimensions of argumentative competence, including logical coherence, rhetorical persuasion, dialogic engagement, and epistemic stance (Rapanta and Macagno, 2019; Yasuda, 2023; Papangkorn and Phoocharoensil, 2021). Argument models also mediate between theory and practice by informing assessment frameworks, rubric development, and feedback practices, thereby promoting transparency and consistency in evaluating academic arguments (Ozfidan and Mitchell, 2022; Paris et al., 2025; Lesterhuis et al., 2018). In digital and AI-mediated learning environments, these models increasingly guide the design of adaptive feedback systems, argument mapping tools, and chatbot-based scaffolding for argumentative writing (Benetos and Bétrancourt, 2020; Guo et al., 2022; Su et al., 2023; Wambsganss et al., 2020). Consequently, the study and integration of argumentation models are not

optional but essential for advancing both theoretical understanding and pedagogical practice in argumentative writing within higher education.

The Classical (Aristotelian) Argument Model

The Classical Argument Model originates in classical rhetoric, most notably in the works of Aristotle and Cicero, and represents one of the earliest systematic frameworks for persuasive communication (Lawson-Tancred, 1992). It conceptualises argumentation as a structured, goal-oriented process aimed at persuading an audience through logical coherence, clarity of reasoning, and effective organisation. The classical argument structure is a persuasive writing format that consists of five main parts: introduction, narration, confirmation, refutation, and conclusion (Table 6). Owing to its emphasis on orderly reasoning and persuasive effectiveness, this model has been widely applied in philosophy, rhetoric, law, and academic and persuasive writing.

Table 6. Classical argument model⁸

Таблица 6. Классическая модель аргумента

	Part	Explanation
1	Introduction (Exordium)	Establishes the context and captures the audience's attention.
2	Narration (Narratio)	Presents background information and facts relevant to the issue.
3	Confirmation (Confirmatio)	Provides evidence and reasoning supporting the main argument.
4	Refutation (Refutatio)	Addresses and counters opposing viewpoints
5	Conclusion (Peroratio)	Summarizes the argument and appeals to the audience's emotions or values.

⁸ Based on Lawson-Tancred, H. (1992). *The Art of Rhetoric*. Penguin Publishing Group.

In the contemporary research corpus on academic argumentative writing, however, the Classical model is not explicitly foregrounded as an analytical or pedagogical framework. Instead, it functions primarily as a theoretical background tradition that informs later models of argumentation (Zhang, 2016; Rapanta and Macagno, 2019). None of the reviewed empirical studies adopts Aristotelian categories such as ethos, pathos, and logos as formal coding schemes or assessment criteria. Rather, classical principles surface indirectly in discussions of claims, evidence, persuasion, audience awareness, and logical coherence.

Several studies implicitly draw on Aristotelian reasoning without naming the model directly. For example, Abdollahzadeh et al. (2017) analyse argumentative writing behaviour through claims, reasons, and evidence. Although their analytical framework is largely Toulmin-inspired, the underlying concern with rational persuasion and coherent reasoning reflects classical rhetorical logic. Similarly, Stapleton and Wu (2015) distinguish between surface textual features and the substantive quality of arguments, foregrounding logos-driven persuasion and argumentative substance (central concerns of Aristotelian rhetoric). Foundational overviews of argumentative writing by Ferretti and Fan (2016) and Ferretti and Lewis (2019) situate modern instructional and cognitive approaches within a broader rhetorical tradition, explicitly acknowledging

classical rhetoric as the historical foundation upon which contemporary models are built.

Overall, the Classical Argument Model occupies a historical and conceptual role within the corpus rather than serving as an active methodological choice. Its influence is mediated through later frameworks (most notably Toulmin's model) which offer greater analytical explicitness and pedagogical operability. This pattern reflects a broader disciplinary shift in academic writing research from rhetorically general models toward analytically precise and empirically tractable approaches, while still retaining classical rhetoric as an enduring intellectual foundation for understanding persuasion, reasoning, and audience engagement in academic argumentation.

Critical Literacy Argument

Sánchez-Peña and Chapetón (2018) do not propose a formal, text-analytic classification of arguments (e.g. Toulminian or Aristotelian). Instead, they advance a critical-dialogic re-conceptualisation of argumentation, where arguments are classified implicitly through their social function, ethical orientation, and dialogic purpose, rather than through structural components (Table 7). Their classification of arguments emerges qualitatively from learners' writing practices within a critical literacy framework. Thus, argument types are characterized by how participants construct and support claims as well as the discursive means they use to make their arguments persuasive and contextually grounded.

Table 7. Critical-dialogic argument classification⁹

Таблица 7. Критико-диалогическая классификация аргумента

Criteria	Argument	Explanation
depending on a type	authority	citing an authority or comparison to an accepted point of view to justify a claim
	analogy	to illustrate new ideas via familiar comparisons, helping readers see the

⁹ Based on Sánchez-Peña, D. and Chapetón, C. M. (2018). Fostering the Development of Written Argumentative Competence in ELT from a Critical Literacy Approach. *Revista Colombiana de Educación*, 75, Article 75. <https://doi.org/10.17227/rce.num75-8107>

		plausibility of the claim
	cause-effect	causal links to explain why a phenomenon occurs or why a claim holds
	deductive	general principles to derive specific claims, demonstrating basic formal reasoning (e.g., “if ... then ...” structures)
	inductive	specific examples to derive general claims, demonstrating basic informal reasoning (e.g., “because ...” structures)
means of providing arguments	by example from their context	contextual examples from personal experience or local contexts (e.g., social issues) are used to support general propositions, reinforcing claim credibility
	from other sources	for example, statistics acts like empirical backing that supports claims through quantification, enhancing their credibility and epistemic weight
	rebuttals	They aim to reframe rather than simply refute opposing views.
	counter-arguments	exercising critical judgement by weighing competing claims rather than reproducing a single dominant discourse.

Classification Based on the Level of Argument Integration

To operationalise argumentative writing quality, some studies use classifications that focus on how writers integrate perspectives and information drawn from multiple sources. A widely cited example is an integration-level classification. Mateos et al. (2018) describe argument quality as a continuum of epistemic

integration, capturing how writers incorporate, relate, and transform potentially conflicting information from sources. In this model, higher levels correspond to more coordinated perspective management and more advanced knowledge construction, providing an analytic basis for distinguishing superficial juxtaposition from integrative synthesis (Table 8).

Table 8. Argument classification based on its level of integration¹⁰

Таблица 8. Классификация аргумента, основанная на уровне его внедрения

Level	Description
(0) Personal opinion not based on source texts	Gives personal opinion on the topic without including arguments from the texts. The argument is based on an argument from the texts but wanders far from them.
(1) Neutral	Does not take a clear position. Describes or lists arguments for

¹⁰ Based on Mateos, M., Martín, E., Cuevas, I., Villalón, R., Martínez, I. and González-Lamas, J. (2018). Improving Written Argumentative Synthesis by Teaching the Integration of Conflicting Information from Multiple Sources. *Cognition and Instruction*, 36(2), 119–138. <https://doi.org/10.1080/07370008.2018.1425300>

	both positions (either in a linear way, laying out all arguments for one position and then all the arguments for the other, or by alternating arguments for both positions).
(2) Argues in support	Takes one of the two positions and argues in favour of that position without considering the opposing position. May include some refutation or integration but basically relies on the defended position. Lists arguments for both positions and concludes by taking a stance in support of one of the positions.
(3) Integration via refutation	Takes a position in support of one of the two perspectives and argues in its favour while refuting the opposing perspective (approximately % of arguments used are rebuttals).
(4) Minimum integration via weighing or synthesising	Takes a position in support of one or both perspectives and argues by weighing or synthesizing arguments from both positions (two integrations) throughout the text. Includes two integrations, one in the body of the text and another in the conclusion. Includes two integrations, both in the conclusion.
(5) Average integration via weighing or synthesising	Takes a position in support of one or both perspectives and argues by weighing or synthesizing arguments from both positions (integrating at least two) throughout the text. Weighs or synthesizes arguments from both positions throughout the text (integrating three or more).
(6) Maximum integration via weighing or synthesising	Integrates throughout the text (at least twice). Presents both positions.

Although integration scales make the construct measurable, they also demonstrate why “argument quality” is not necessarily comparable across studies. For example, text may score highly on integration but remain weak on evidential justification, or vice versa, depending on the criteria adopted.

Functional Classification of Argument

In addition to component-based and integration-based approaches, the corpus includes functional classifications that treat argumentation as a distribution of discourse roles across extended text units. McCarthy et al. (2022), for example, operationalise argument structure by identifying paragraph functions such as support, counter-argument, and related moves (Table 9). This perspective

is designed for corpus-scale analysis and foregrounds how argumentative work is staged across a text rather than how individual claims are diagrammed.

This classification differs from Classical and Toulmin-based frameworks in that it does not decompose arguments into components such as claims, warrants, and rebuttals. Instead, it operationalises argumentation at the level of extended discourse units by assigning functional roles to paragraphs or segments. This approach supports systematic comparison of linguistic and rhetorical features across supportive and counter-argumentative discourse within student texts (Table 9).

Table 9. Functional argument classification¹¹

Таблица 9. Функциональная классификация аргумента

Support	A support paragraph is one that aims to support either the author's main claim or a subclaim by providing evidence, examples, and research. Typically, a support paragraph would be structured in a way such that it: (1) begins with a topic sentence that clearly states a claim supporting the author's main argument, (2) provides evidence and/or examples to support the claim made in the topic sentence, (3) is completed with a sentence that summarizes, evaluates, or reinforces the claim of the paragraph.
Counter-argument	A counter-argument paragraph is one that aims to challenge the author's main claim either directly or indirectly. A counter-argument consists of a counterclaim that is further backed up by evidence. Similar to support, an effective counter-argument paragraph would be constructed in a way such that (1) It begins with a counterclaim that challenges the author's main argument, (2) provides evidence and examples to support the counterclaim, (3) is completed with a sentence that summarizes, evaluates, or reinforces the counterclaim of the paragraph.
Expostulation	A paragraph that is distinct from but related to a counter-argument. For example, an expostulation could be a refutation or rebuttal of the counter argument. As such, an expostulation paragraph cannot exist on its own; it has to be preceded by a Counter-argument paragraph.
Other	Paragraphs that did not perform clear functions of any of the previously discussed types, they served various functions.

Operational Structure of Arguments

Some studies define argument structure through pedagogical enactment rather than formal typology. Musa (2019), for instance, specifies an operational structure that connects argumentative elements to staged instructional activities and expected textual

outcomes (Table 10). In this formulation, formal components of argument are coupled with dialogic competencies, including explicit attention to counterargument and rebuttal.

¹¹ Based on McCarthy, P. M., Kaddoura, N. W., Al-Harthy, A., Thomas, A. M., Duran, N. D. and Ahmed, K. (2022). Corpus Analysis on Students' Counter and Support Arguments in Argumentative Writing. *Pegem Egitim ve Ogretim Dergisi*, 12(1), 256–271. Scopus. <https://doi.org/10.47750/pegegog.12.01.27>

Table 10. Operational argument structure¹²

Таблица 10. Операционная структура аргумента

Stage	Description
Claim / Position	Students offer one standpoint.
Supporting Reasoning / Evidence	Students provide four reasons for this standpoint; these reasons are presented as two multiple arguments with two supporting details
Counterargument Awareness	Students are encouraged to consider and respond to opposing views.
Rebuttal / Response	Students provide a rebuttal (a statement that refutes or undermines an alternative standpoint) for the counterargument in order to strengthen the writer's stance.
Textual Organization	Students include one rhetorically functional repetition; a statement that restates previously expressed reasons, arguments, or standpoints.

Table 10 operationalises argument structure in a granular way by specifying the expected configuration of components within a student text. In the illustrated scheme, an argument based on Musa (2019) comprises fourteen elements, including one standpoint, four reasons, six subordinating reasons, one counterargument, one rebuttal, and one rhetorically functional repetition. This operationalisation is hybrid in nature, because formal textual components such as the claim, reasons, and rebuttal are coupled with dialogic work on alternative perspectives, treating argumentation as both structured composition and interactive reasoning practice. Framed this way, the scheme makes explicit how instructional sequencing and assessment criteria are anchored in particular assumptions about what counts as a strong argument.

The Rogerian argument

The Rogerian argument (or Rogerian rhetoric) is a form of argumentative reasoning that aims to establish a middle ground between parties with opposing viewpoints or goals (Table 11). It was developed by psychotherapist Carl Rogers (1961) and adapted to rhetoric argumentation by writing scholars Young, Becker, and Pike (1970). While Aristotelian styles of argument are often seen as eristic (concerned primarily with winning), the Rogerian argument can be viewed as more dialectic in nature (a conversation between two or more parties with the goal of arriving at some mutually-satisfying solution). It is particularly useful for highly controversial topics, conflict resolution, negotiation, counseling, and fields like psychology or social work where building consensus is key.

¹² Based on Musa, H. I. (2019). Dialogic vs. Formalist teaching in developing argumentative writing discourse and reducing speaking apprehension among efl majors. *Journal of Language Teaching and Research*, 10(5), 895–905. Scopus. <https://doi.org/10.17507/jltr.1005.01>

Table 11. The Rogerian model of argumentation¹³

Таблица 11. Модель аргументации Роджерса

	Stage	Description
1	Introduction	Present the issue and acknowledge the opposing viewpoint.
2	Position 1 (Summary of Opponent's Position)	Accurately and fairly summarize the other side's perspective.
3	Position 2 (Statement of Own Position)	Clearly articulate your own viewpoint.
4	Bridge (Shared Understanding)	Highlight areas of agreement or common ground.
5	Compromise (Proposal for Cooperation)	Suggest solutions or compromises based on mutual understanding.

The Rogerian model of argumentation, which emphasises empathy, audience alignment, and consensus-building, is not clearly represented in the corpus. No study explicitly frames its analysis or pedagogy around a Rogerian structure. Nevertheless, Rogerian principles appear indirectly in work that foregrounds dialogic interaction, perspective-taking, and collaborative meaning-making. For example, studies on dialogic teaching and collaborative argumentation (e.g., De Castro Daza et al., 2022; Najjemba and Cronjé, 2020; Musa, 2019) reflect Rogerian concerns with mutual understanding and negotiated reasoning. Similarly, research on audience awareness and stance-taking (e.g., Hutasuht et al., 2023; Papangkorn and Phoocharoensil, 2021) resonates with Rogerian ideas without

naming the model explicitly. In these cases, Rogerian argumentation is conceptually diffused rather than structurally instantiated.

The Toulmin Model of Argumentation

The Toulmin model of argumentation (Toulmin, 1958; 2003; Toulmin et al., 1984), which posits that the function of an argument is the justification of a claim through components such as claim, grounds, warrant, backing, qualifier, and rebuttal, has been pivotal in highlighting the need to address alternative viewpoints in claims (Table 12). Extremely common in social sciences, natural sciences, policy arguments, and fields requiring nuanced analysis, it offers a structured, adaptable approach for identifying, tackling, and teaching effective argumentative writing strategies, particularly for students struggling with argumentative essays.

¹³ Based on Rogers, C. R. (1961). *On Becoming a Person: A Therapist's View of Psychotherapy*. Houghton Mifflin and Young, R. E., Becker, A. L. and Pike, K. L. (1970). *Rhetoric: Discovery and Change*. Harcourt, Brace & World. 383 p. <https://books.google.ru/books?id=tKktkEUZxWQC>

Table 12. Toulmin classification of argument¹⁴

Таблица 12. Классификация аргумента по Тулмину

Part	Explanation
Claim	The statement that clearly highlights what the author wants to prove to the readers.
Grounds	It supports and builds on the author's claim. This section consists of the evidence using methods such as facts, statistics, examples, and reasoning.
Warrant	It serves to link the claim and the grounds.
Backing	It provides additional support to prove the implied arguments in both the warrant and the claim (a specific example to give justification to an implied warrant). This example can acknowledge supplemental questions about the argument and further build on the credibility of the argument.
Qualifier	It points out possible or existing limitations to the argument; it is a technique rather than a physical section of Toulmin's model. Qualifiers are most often identified by using words such as "presumably," "some," or "many."
Rebuttal	It helps to further strengthen the argument by addressing any counter-arguments. The rebuttal emphasizes the importance of maintaining an unbiased tone. By acknowledging counter arguments and remaining unbiased a writer builds credibility and, consequently, draws more attention to the value of the argument.

This framework aligns theory with practice, potentially inspiring comprehensive questionnaires to evaluate students' grasp of these strategies and fostering proficiency in crafting compelling, well-structured essays (Mallahi, 2024). Its pedagogical usability is evident in how it perpetuates argumentative writing as identifiable forms, including thesis identification, supportive evidence, warrant assessment connecting thesis, evidence, and context, and anticipation of counterarguments in diverse societies (Newell et al., 2015; Weyand et al., 2018).

Despite its strengths, researchers have noted challenges in reliably applying the model, as student arguments often fit multiple elements, complicating classification (Stapleton and Wu, 2015). Nonetheless, Toulmin remains the most explicitly present and systematically employed framework in empirical research on argumentative writing, especially in EFL and academic contexts, where it bridges theory and practice through analytical transparency and measurable operationalization of argument quality.

¹⁴ Based on Toulmin, S. (1958). *The Uses of Argument*. Cambridge University Press and Toulmin, S. E., Rieke, R. D. and Janik, A. (1984). *An introduction to reasoning* (2nd ed.). New York: Collier Macmillan.

Multiple studies directly adopt or adapt its components for instructional, analytical, and assessment purposes. For instance, Zainuddin and Shammem (2016) developed six scoring criteria: claims, data, and warrant (0–6 points) and propositions, opposition, and response (0–3 points), emphasizing the core triad's heavier weighting. Lam, Hew, and Chiu (2018) used a 1-4 analytic rubric across five criteria: stance with evidence, anti-thesis support, evaluation of viewpoints and inferences, rebuttals, and thesis-anti-thesis-supported conclusions. Similarly, Deane et al. (2019), Lu and Swatevacharkul (2021), and others ground assessments in Toulmin by classifying texts into components for component-specific scoring.

Corpus and empirical analyses further underscore implicit Toulminian influences: McCarthy et al. (2022) distinguished support and counterarguments via claim–data–rebuttal logic; Stapleton and Wu (2015) linked substance (claims, evidence quality, reasoning) to the claim–data–warrant triad; Ferretti and Fan (2016) and Ferretti and Lewis (2019) framed pedagogy around claims, evidence, reasoning, and counterarguments; Kibler and Hardigree (2017) examined evidence–claim connections as warrants; Weyand, Goff, and Newell (2018) explicitly addressed the social construction of warrants; and Geng, Chen, and Li (2024) mapped argument chains (claim development, justification, alternatives) to extended Toulmin structures. This widespread adoption highlights the model's versatility in evaluating evidence use, counterargumentation, and overall argument quality.

In EFL and academic writing contexts, Toulmin's model functions as a vital bridge between theoretical constructs and practical application. It helps students move beyond formulaic writing by encouraging them to articulate claims clearly, ground them in relevant evidence, justify connections through warrants, anticipate counterarguments, and respond respectfully to alternative viewpoints, skills essential for participation in heterogeneous societies and complex

disciplinary discourse (Newell et al., 2015). Whether used explicitly in scoring rubrics, implicitly in corpus analyses, or pedagogically to scaffold argumentative forms (Weyand et al., 2018).

Cluster 4. Critical Thinking as a Tool for Argumentative Writing

Critical thinking (CT) is widely regarded as a central objective of higher education and a foundation for developing key learning outcomes (Sharadgah et al., 2019; Ilyas and Arifin, 2025). It requires educators to carefully design instructional materials and create classroom activities that stimulate deep reflection and strengthen reasoning skills (Wang and Newell, 2025) which enables students to reflect on and understand their own viewpoints, drawing on their observations and experience to make sense of information and situations (Raj et al., 2022). Empirical work suggests a reciprocal relationship between CT and writing: the more proficient students are in critical thinking, the better their writing skills tend to be, and strong writing practice can in turn foster more advanced CT (Sharadgah et al., 2019).

Argumentative writing is a particularly rich site for the exercise and development of critical thinking because it requires higher order skills such as analysis, reasoning, and evaluation (Ilyas and Arifin, 2025; Ekalia et al., 2025). These cognitive processes, identifying issues, weighing evidence, judging the relevance and credibility of information, and justifying positions, are typically understood as core CT skills (Lu and Swatevacharkul, 2021; Nguyen and Nguyen, 2020). For ESL/EFL learners in higher education, such skills are crucial for producing sound written texts, especially argumentative essays that must present claims, support them with appropriate evidence, and address alternative viewpoints (Ghaemi and Mirsaeed, 2017; Newell et al., 2015; Weyand et al., 2018). Argumentation enhances critical thinking by prompting writers to compare competing ideas, evaluate reasons and evidence, and reach rational

conclusions on the basis of their evaluations (Ferretti and Fan, 2016; Klein et al., 2016).

From a cognitive standpoint, the basis of effective argumentative writing lies in critical and logical thinking: writers must connect premises and evidence to draw coherent, justified conclusions (Mulyati and Hadianito, 2023). Evidence in this sense includes facts, testimony, information, or authoritative sources that can be used to support or challenge a claim, and critical thinking enables students to judge how such evidence should be selected, interpreted, and integrated (Mulyati and Hadianito, 2023). Thus, CT is not only visible in the final written product but also drives the reasoning processes that underlie the construction of arguments and their components, such as claims, warrants, and supporting data (Newell et al., 2015; Weyand et al., 2018).

In argumentative writing, students generate an argument where questions, claims, and evidence cohesively connect to explain the outcomes of an inquiry (Lamb et al., 2019). Through argumentation, the writer is able to assemble the facts in such a way, so that he is able to show whether an opinion or a certain thing is true or not (Mulyati and Hadianito, 2023). Argumentative writers need to take each of the following elements into careful consideration in order to compose a successful argumentative essay, namely, Claim, My side, Your side, Evidence, Backing, Rebuttal and Conclusion (Lu and Swatevacharkul, 2021). Argumentative writing becomes more “critical” when the following reasoning skills are evident: (1) the construction of valid arguments; (2) the construction and integration of valid counter-arguments; and (3) the accurate and relevant use of evidence (Rapanta and Macagno, 2019).

Pedagogically, fostering students’ critical thinking through argumentative writing requires more than teaching text structures; it calls for instructional approaches that explicitly cultivate reflective and evaluative reasoning. Critical pedagogy is frequently identified as a key approach in this

regard, as it encourages learners to interrogate assumptions, question sources, and engage with controversial or complex issues rather than merely reproduce given ideas (Qian, 2015). Teachers who implement such curricular goals need to design writing tasks that invite students to think, to scrutinise the originality and relevance of their ideas, and to develop arguments that can withstand critical examination (Ghanbari and Salari, 2022). When students are guided to construct, justify, and revise their positions in this way, argumentative writing becomes both an expression of critical thinking and a powerful means of cultivating it.

Cluster 5. Digitalisation and AI Tools for Argumentative Writing

Digitalisation has expanded how argumentation is taught, learned, and enacted in writing, leading to a growing ecosystem of tools that support learners’ reasoning and text production. Within this landscape, digital tools for argumentation can be described as falling into two broad, non-exclusive types: (1) tools that primarily support idea generation and conceptual relations, and (2) tools that primarily support the linguistic and formal quality of written products (Benetos and Bétrancourt, 2020).

The first type supports idea generation and relationship building between concepts, often through diagrammatic representations. These tools typically rely on predefined argumentation models to help learners map arguments for and against a position. In collaborative learning contexts, such modelling can guide reasoning by drawing attention to cognitive conflict and promoting its resolution. Their overarching aim is to support valid argument construction for “sense-making” and theory-building, enabling learners to test concepts, theories, and hypotheses through structured argumentation (Benetos and Bétrancourt, 2020). Argument visualization tools exemplify this approach: they function as cognitive tools that scaffold learners’ analysis, evaluation, and construction of arguments by guiding the

development of argument schemas (Nesbit et al., 2019).

The second type of tool focuses on improving the textual product. Here, digital support targets mechanical aspects of writing quality, including micro-level language concerns such as grammar, language use, and sentence structure, as well as macro-level concerns such as overall organization (Benetos and Bétrancourt, 2020). Despite these advances, a key limitation remains: there is a lack of tools that directly support writing processes at both the macro-level (e.g., *strategy development, self-monitoring, argumentative structure, rhetorical moves*) and the micro-level (e.g., *reasoning, argument validity, and structural coherence*) (Benetos and Bétrancourt, 2020). This gap is central for the design of digital authoring tools intended to support argumentative writing.

Accordingly, the design of such tools draws on two major research areas: first, the conditions that engage learners in resolving cognitive conflict, which can lead to deeper learning and conceptual change; and second, the difficulties novices face when producing argumentative texts as a genre (Benetos and Bétrancourt, 2020). This design orientation also aligns with broader work encouraging researchers to examine how technology and AI supports English argumentative writing both inside and outside the classroom (Maharani and Santosa, 2021; Lee et al., 2022; Khampusaen, 2025). In particular, online collaborative writing environments allow students to jointly complete argumentative texts without constraints of time and place, and may offer more opportunity than classroom discussion for learners to focus on the language of their argumentative writing, an aspect they often neglect during in-class interaction (Jin et al., 2020).

Within this digital turn, conversational agents have emerged as a promising mechanism for supporting argumentation and argumentative writing. ChatGPT, for example, has been positioned as a tool that can facilitate communication skills by

engaging students in debate-like interactions where they practice and develop argumentative skills (Farrohnia et al., 2023).

Crucially, the literature published toward the end of the review period (2023–2025) marks a clear paradigm shift from traditional Automated Writing Evaluation (AWE) to Generative AI and Large Language Models (LLMs). While earlier AWE systems (relying on traditional NLP) primarily functioned as diagnostic tools, identifying missing structural components or highlighting grammatical errors, modern Generative AI (e.g., ChatGPT) acts as a dialogic partner. These LLM-based tools shift the pedagogical focus from post-hoc correction to synchronous co-creation, offering dynamic counterarguments, adjusting reading levels for diverse learners, and modeling Rogerian empathy in real-time. This transition requires a fundamental re-evaluation of assessment rubrics, moving from evaluating the mere presence of argument elements to assessing the student's ability to critically prompt, evaluate, and iteratively refine AI-generated reasoning.

More specifically, chatbots may support argumentative writing in several ways: by providing prompt and substantive feedback throughout the writing process to promote continuous reflection; by asking guiding questions that elicit essential argument components such as claims, evidence, and reasoning; by storing interactions as transcripts that document the writing process and reveal learning needs for teacher support; and by integrating into instant messaging platforms to make writing support convenient and familiar (Guo et al., 2022). Khampusaen (2025) noticed marked progression in argument construction, evidence integration, and academic voice as a result of AI integration, particularly ChatGPT, into academic writing practices. A concrete example is “Argumate”, a chatbot designed to scaffold argumentative writing by prompting key argument elements, suggesting ideas that support a student's position, and proposing opposing views that learners must rebut (Guo

et al., 2022). In practice, learners' work with chatbots may also be mediated by additional digital supports (online information sources, translation tools, and typing assistants) which shape how collaboration unfolds and how texts are produced (Guo et al., 2023).

In parallel, natural language processing approaches provide further possibilities for digitalising argumentation in text. Argument mining seeks to automatically extract arguments and the relationships between them, typically through (1) Argument Component Identification, which locates and labels components such as claims and premises, and (2) Relationship Identification, which determines whether components support, attack, or have no relation to each other (Lawrence and Reed, 2020). Since understanding argumentative structure helps identify not only an author's stance but also the reasons offered to justify it, argument mining can be seen as a potential foundation for tools that diagnose and scaffold reasoning quality in learners' writing (Yang et al., 2023). Together with argument visualization tools that externalise argument structure for learners to inspect and revise (Nesbit et al., 2019), these approaches indicate a broader shift: from tools that only capture ideas or polish language, toward systems that can scaffold argumentative writing as a structured, reflective, and cognitively demanding process (Benetos and Bétrancourt, 2020).

Discussion

The present systematic scoping review set out to reconstruct how research on argument in academic writing in higher education has been conceptualised and operationalised over the past decade. The analysis focused on definitions of argumentative writing, the models used to represent argument structure and quality, the functions attributed to argumentation, and the dominant thematic directions shaping the field. Such a focus was necessary in view of the well documented heterogeneity of conceptual and methodological approaches, which complicates the accumulation and comparison of findings across studies.

The mapping of 95 sources indicates that the field is simultaneously consolidating and diversifying. On the one hand, a relatively stable set of modelling traditions continues to structure research, most notably Toulmin based approaches, alongside Classical and dialogic perspectives. On the other hand, the thematic scope of studies is expanding, particularly through the growing attention to digitally mediated writing environments and AI supported instruction. The field is organised around four broad clusters, including theoretical and methodological work, assessment and analytic approaches, sociolinguistic and cross linguistic dimensions, and cognitive and educational determinants of argumentative writing. At the same time, publication patterns reveal a strong geographical concentration, with a substantial proportion of studies conducted in Asian educational contexts, which may have for the generalisability of reported findings.

The evidence further confirms that research on argumentative writing is inherently interdisciplinary, drawing on applied linguistics, writing studies, educational psychology, and technology enhanced learning. This interdisciplinarity helps explain the coexistence of heterogeneous conceptual vocabularies and analytic traditions. Empirical studies dominate the corpus and most frequently take the form of corpus-based analyses, classroom interventions, and assessment-oriented research-centred on rubric design and rating practices. However, the distribution of designs also suggests that many studies prioritise local explanatory adequacy over cross study comparability, particularly when argument quality is operationalised through context specific coding schemes or locally developed assessment instruments (Stapleton and Wu, 2015; Paris et al., 2025).

Several gaps emerge with sufficient consistency to be interpreted as structural features of the field. First, operational definitions of argument quality remain uneven, even within studies that draw on the same modelling traditions. In particular, the

relationship between structural completeness and the quality of reasoning is not always made explicit, which complicates the interpretation of findings. This issue has been noted in studies showing that the presence of argument components does not necessarily correspond to the strength of justification or the relevance of evidence (Abdollahzadeh et al., 2017). Second, although digitalisation is a clear trend, the integration of AI based tools into established models of argumentation remains limited. While chatbots and automated systems are increasingly used to support the generation of claims, evidence, and counterarguments, their implications for construct validity and assessment interpretation are not yet fully articulated (Benetos and Bétrancourt, 2020; Wambsganss et al., 2020; Khampusaen, 2025). Third, sociolinguistic and multilingual perspectives are often examined independently of assessment practices, despite the fact that argument quality is shaped by both linguistic resources and evaluative criteria. Finally, although cognitive and motivational variables are widely discussed, their connection to specific instructional designs and long-term development remains insufficiently explored, with relatively few studies adopting longitudinal perspectives (Kibler and Hardigree, 2017).

Comparison of the Most Popular Argument Models

The mapping indicates that model choice is not merely terminological. It structures what studies treat as argument quality, which instructional targets they prioritise, and which analytic procedures they adopt. To make this relationship explicit, this section compares the three most visible traditions in the corpus, namely Classical rhetorical organisation, Toulmin's componential model, and Rogerian dialogic reasoning, with attention to their core orientation, organisational logic, and typical pedagogical and assessment uses in higher education EFL contexts (Mallahi, 2024; Wang and Said, 2024).

Across the mapped studies, these traditions align with different dimensions of argumentative competence and, accordingly, with different outcome measures. Classical organisation most directly supports rhetorical sequencing and genre coherence, providing novice and EFL writers with a stable macro structure for controlling genre conventions, textual coherence, and audience orientation (Ferretti and Lewis, 2019; Zhang and Zhang, 2021; Ozfidan and Mitchell, 2022). Yet its formulaic character can constrain rhetorical flexibility and may not readily accommodate culturally diverse discourse practices or rhetorical expectations, particularly for linguistically and culturally diverse learners working within academic conventions shaped by Western traditions (Allen et al., 2019; Sharadgah et al., 2019; Kleemola et al., 2022; Ghanbari and Salari, 2022).

Toulmin based approaches foreground structural adequacy and justificatory relations by treating arguments as interrelated functional components, thereby strengthening learners' ability to justify claims, integrate evidence, and articulate warrants (Stapleton and Wu, 2015; Zainuddin and Shammem, 2016; Ghaemi and Mirsaeed, 2017; Hu and Saleem, 2023). This analytic clarity also explains their prominence in assessment and coding-oriented studies. At the same time, classroom application can be complicated by classification ambiguity, since student statements may plausibly fit multiple elements, which reduces reliability in both instruction and assessment (Stapleton and Wu, 2015). In addition, a strong emphasis on logos-centred analysis may underrepresent ethos and pathos as resources for persuasive effectiveness, and some accounts caution that pedagogical use can drift toward a formal checklist that obscures argumentation as situated rhetorical practice (Ferretti and Lewis, 2019; Weyand et al., 2018).

Rogerian reasoning highlights dialogic engagement, reframing argumentation as a collaborative practice oriented toward perspective taking, intercultural communicative competence, and negotiated

understanding (Musa, 2019; De Castro Daza et al., 2022; Robillos and Art in, 2023). In EFL settings, this orientation is relevant to instruction that aims to develop respectful handling of alternative viewpoints and audience responsiveness. However, the approach is linguistically and temporally demanding, requiring sophisticated language resources for empathetic restatement and nuanced positioning, which can pose difficulties for lower proficiency learners (Papangkorn and Phoocharoensil, 2021; Almashour and Davies, 2023). Its consensus orientation may also be less effective in high stakes contexts that reward direct claims and decisive argumentative positioning (Yasuda, 2023).

These models function as complementary rather than interchangeable pedagogical resources. The Classical tradition offers structural scaffolding for genre control, Toulmin supports analytic rigour in evidence-based justification, and Rogerian foregrounds dialogic sensitivity and audience attunement. The mapped literature therefore points toward principled integration, in which instructional design and assessment criteria make explicit which dimension of argumentative competence is being targeted and how it is weighted, rather than assuming that different models yield commensurable outcomes by default (Mallahi, 2024; Wang and Said, 2024). Toulmin's model serves as the most systematically employed framework in the empirical study and teaching of argumentation, offering clarity, structure, and depth to the art of reasoned persuasion.

A Three-dimensional Taxonomy of Argument Quality Operationalisations

A central outcome of the present review concerns the internal differentiation of how argument quality is conceptualised across the literature. The observed fragmentation reflects not only variation in terminology but also deeper differences in what is treated as the core of argumentation. To make these differences analytically explicit, the review identifies three recurrent dimensions along

which argument quality is operationalised across studies.

The first dimension concerns structural adequacy, understood as the presence and organisation of key components of an argument. This dimension is most closely associated with Toulmin based approaches and with assessment practices that foreground claims, evidence, and their relations (Stapleton and Wu, 2015; Rapanta and Macagno, 2019; Paris et al., 2025). The second dimension relates to dialogic engagement, which captures how writers address alternative viewpoints, integrate counterarguments, and position their claims in relation to competing perspectives. This dimension is particularly salient in dialogic and interaction-oriented approaches to argumentation and is increasingly foregrounded in studies that emphasise the role of perspective taking and audience awareness (Su et al., 2023; De Castro Daza et al., 2022; Najjemba and Cronjé, 2020). The third dimension concerns rhetorical organisation, including the structuring of arguments in accordance with genre expectations, the management of stance, and the overall persuasive coherence of the text. This aspect is especially visible in research on academic discourse and multilingual writing, where rhetorical conventions and audience expectations play a central role (Yasuda, 2023; Cheong et al., 2021; Papangkorn and Phoocharoensil, 2021). In Appendix 4 we mapped the review sources to these dimensions.

Considered together, these dimensions help explain why studies that appear to address the same construct often produce non comparable results. Research that focuses on structural features tends to rely on component based coding or automated analysis, whereas studies that foreground dialogic or rhetorical aspects more often employ rubric-based evaluation requiring interpretive judgement. Unless the relationship between these dimensions is made explicit, differences in findings may reflect differences in

operationalisation rather than substantive disagreement.

This issue becomes particularly salient in digitally mediated environments, where support and assessment are increasingly delivered through automated feedback systems, argument-mining procedures, and AI-assisted writing tools (Benetos and Bétrancourt, 2020; Wambsganss et al., 2020; Khampusaen, 2025). Under these conditions, the interpretability of outcomes depends on whether digital support is aligned with the specific construct dimension being targeted, rather than treated as a conceptually neutral intervention.

In contrast to review-level work that narrows the scope to particular subdomains, the present study was designed as a field reconstruction across definitional, methodological, and technology-mediated lines of research. For example, a recent systematic review charts L2 argumentative writing as a domain of second language writing research (Amini Farsani et al., 2025), while a scoping review focused on EFL contexts synthesises cognitive challenges in argumentative writing (Wang and Said, 2024). These contributions consolidate specific dimensions of the literature, yet they do not aim to map how model choice, operational definitions, assessment practices, and digital mediation co-evolve across the broader research space. The present review addresses this gap by integrating evidence across these dimensions and showing how their interaction structures current research trajectories.

The contribution of this study lies in making visible the underlying structure of the field and in clarifying where conceptual alignment is possible and where it remains limited. At the same time, the findings should be interpreted in light of the review's scope, which is restricted to English language publications indexed in Scopus over the period from 2015 to 2025. As a result, the map does not fully capture research published in other languages or outside major indexing systems.

Technology-enhanced Applications

Technology-enhanced implementations are uneven across the three traditions, and this unevenness mirrors the extent to which each model offers an operational structure that can be translated into digital tasks and feedback. In studies that draw on Classical organisation, technology is more often discussed at the level of general digital authoring environments and online training rather than framed around Classical arrangement as a model-specific design principle (Benetos and Bétrancourt, 2020; Luna et al., 2020; Maharani and Santosa, 2021). This pattern is consistent with the model's role as a macro-template for text organisation, which can be supported digitally without being named explicitly as Classical.

By contrast, Toulmin based pedagogy and analysis are more frequently connected to technology-enhanced instruction, including blended and gamified interventions that aim to strengthen engagement and reasoning (Lam et al., 2018; Jin et al., 2020). This linkage is also theoretically congruent with Toulmin's componential architecture, which lends itself to structured digital tasks and feedback systems that foreground claims, evidence, warrants, and rebuttals as explicit and assessable units (Nesbit et al., 2019; Wambsganss et al., 2020; Davies et al., 2021; Liu et al., 2023). Related designs reinforce this logic-focused pathway through online scripting, peer-feedback, and automated feedback that targets evidence use and revision (Latifi et al., 2020; Shi et al., 2022; Mulyati and Hadianito, 2023). The Rogerian tradition shows the most direct linkage to current AI-supported pedagogy, particularly chatbot and ChatGPT-assisted scaffolding that prompts perspective-taking, supports neutral summarisation of opposing views, and facilitates revision toward more dialogic positioning (Guo et al., 2022; Guo et al., 2023; Su et al., 2023). This aligns with broader discussions of generative AI in writing pedagogy and its emerging instructional affordances (Farrokhnia et al., 2023; Khampusaen, 2025), as well as with

work emphasising dialogic processes in collaborative digital argumentative writing (Najjemba and Cronjé, 2020; De Castro Daza et al., 2022). Taken together, the mapped literature suggests three technology pathways, namely comparatively under-specified support compatible with Classical organisation, interactive and feedback-rich tool use aligned with Toulmin's analytic reasoning, and emerging AI enabled scaffolds that operationalise Rogerian perspective-taking and consensus-oriented negotiation.

Strengths and Pedagogical Contributions

In the mapped literature, the three most frequently invoked argumentation traditions are associated with partially different instructional targets, which helps explain variation in both pedagogical design and outcome measures. Work aligned with the Classical tradition is typically used to provide novice writers with a stable organisational template for academic essays, supporting early development of coherent text structure and audience-oriented framing in EFL contexts (Zhang and Zhang, 2021; Ferretti and Lewis, 2019). By contrast, Toulmin based instruction is most often framed as a means of strengthening analytic reasoning within argumentative writing, particularly through explicit attention to claim support and to the inferential link between evidence and conclusions (Zainuddin and Shammem, 2016; Ghaemi and Mirsaeed, 2017; Hu and Saleem, 2023). Several studies in the corpus further indicate that Toulmin oriented pedagogy is compatible with technology supported designs, including blended and gamified interventions, where the model provides a componential structure for scaffolding and feedback (Lam et al., 2018; Jin et al., 2020). A third strand is visible in work drawing on Rogerian and dialogic orientations, where instruction emphasises perspective taking, respectful acknowledgement of alternative viewpoints, and collaborative negotiation of positions, which is particularly salient in diverse classroom contexts (Musa, 2019; De Castro Daza et al., 2022). Within this strand,

collaborative and dialogic writing practices are used to support engagement and self-regulation, and recent studies also report AI assisted scaffolding that prompts writers to articulate opposing positions and revise toward more balanced formulations (Robillos and Thongpai, 2022; Robillos and Art in, 2023; Guo et al., 2022; Guo et al., 2023; Su et al., 2023).

Conclusion

This review set out to provide a systematic reconstruction of research on argument in academic writing in higher education. The analysis has shown that the field is characterised by both continuity and diversification. Established modelling traditions remain influential, yet new lines of work, particularly those related to digital and AI mediated writing, are reshaping both research practices and instructional contexts. At the same time, the synthesis makes clear that shared terminology often conceals differences in how argument quality is defined and measured.

Ultimately, the fragmentation in defining and evaluating argument quality has direct practical implications for curriculum design. For practitioners, this review suggests that assigning "argumentative essays" without explicitly aligning instruction to a specific model (e.g., Toulmin for logical rigor, Rogerian for consensus-building) risks leaving learners confused about expectations. Educators are encouraged to move away from generic rubrics and instead adopt multidimensional assessment frameworks that transparently weight structural adequacy alongside dialogic engagement. Furthermore, as AI tools increasingly automate the mechanical structuring of texts, instructional time must pivot toward higher-order cognitive tasks: evaluating the epistemic validity of evidence, mapping complex argumentative networks, and fostering the ethical integration of alternative viewpoints.

One of the main outcomes of the study is the identification of three recurrent dimensions of argument quality, relating to structural adequacy, dialogic engagement, and

rhetoical organisation. Making these dimensions explicit helps to clarify why findings across studies are not always directly comparable and provides a basis for more transparent interpretation of results. It also highlights the need to specify more precisely what is being assessed when argumentation is evaluated in academic writing.

The conclusions of the review should be interpreted in light of several limitations. The analysis is restricted to English language publications indexed in Scopus between 2015 and 2025, which limits the coverage of research produced in other linguistic and regional contexts. In addition, the study follows the logic of a scoping review and does not include a formal quality appraisal of individual sources. Finally, the diversity of research designs and operational definitions within the corpus constrains the extent to which direct comparisons between studies can be drawn.

These limitations point to several directions for further research. There is a need for greater clarity in the definition and measurement of argument quality, including explicit consideration of how different dimensions of argumentation are combined in analytic and assessment frameworks. Further work is also required to align digital and AI mediated tools with theoretical models of argumentation, particularly with respect to how such tools influence both writing processes and evaluation practices. In addition, more attention should be given to the integration of sociolinguistic and multilingual perspectives with instructional design and assessment. Finally, longitudinal research is needed to trace the development of argumentative competence over time, especially in contexts where digital feedback and automated support are embedded in academic writing instruction.

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did not contribute to the conceptualisation, analysis, or interpretation of the data. All content, arguments, and conclusions remain the responsibility of the authors.

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Elena V. Tikhonova, Cand. Sci. (History), Associate Professor, Associate Professor of the Department of English Language, MGIMO University, Moscow, Russia.

Елена Викторовна Тихонова, кандидат исторических наук, доцент, доцент кафедры английского языка № 5 МГИМО МИД России, Москва, Россия.

Daria A. Mezentseva, Lecturer of the Department of the English Language and Professional Communication, Financial University under the Government of the Russian Federation, Moscow, Russia.

Дарья Александровна Мезенцева, преподаватель кафедры английского языка и профессиональной коммуникации Финансового университета при Правительстве РФ, Москва, Россия.

Appendix 1. List of the selected studies

Приложение 1. Список отобранных исследований

№	Title	Tags	Type	Author(s)	Year	Country
1	Argumentative writing behavior of graduate EFL learners	ED, RG, L2,	Journal article	Abdollahzadeh, E., Amini Farsani, M. and Beikmohammadi, M.	2017	Iran
2	Critical thinking in authentic assessment: An exploration into argumentative writing non-English department in higher education	CT, AS, ED, L2	Journal article	Akib, E., Muhsin, M. A., Hamid, S. M. and Irawan, N.	2024	Indonesia
3	The use of interactional metadiscourse markers by Saudi EFL male and female college students: The case of a gender-sensitive topic	ED, L2	Journal article	Al-Otaibi, G. M. and Hussain, A. A.	2024	Saudi Arabia
4	Writing flexibility in argumentative essays: A multidimensional analysis	COG, ED, AS	Journal article	Allen, L. K., Likens, A. D. and McNamara, D. S.	2019	The USA
5	Exploring learning strategies used by Jordanian university EFL learners in argumentative writing tasks: The role of gender and proficiency	COG, PD, L2, ED	Journal article	Almashour, M. and Davies, A.	2023	Canada
6	Charting L2 argumentative writing: A systematic review	CF, L2	Journal article	Amini Farsani, M., Stapleton, P. and Jamali, H. R.	2025	Iran
7	The 2030 Challenge in the Quality of Higher Education: Metacognitive, Motivational and Structural Factors, Predictive of Written Argumentation, for the Dissemination of Sustainable Knowledge	COG, CT, ED	Journal article	Arroyo González, R., de la Hoz-Ruiz, J. and Montejo Gámez, J.	2020	Spain

8	Adaptive teaching for English language arts: Following the pathway of classroom data in preservice teacher inquiry	PD, SOC	Journal article	Athanases, S. Z., Bennett, L. H. and Wahleithner, J. M.	2015	The USA
9	Digital authoring support for argumentative writing: What does it change?	DIG, PD, COG	Journal article	Benetos, K. and Bétrancourt, M.	2020	Switzerland
10	Source-based argumentation as a form of sustainable academic skill: An exploratory study comparing secondary school students' L1 and L2 writing	CT, ED, L2	Journal article	Cheong, C.-M., Zhu, X. and Xu, W.	2021	China
11	Expressing causality in Croatian L1 and L2 argumentative writing	L2, CF	Journal article	Cvikić, L. and Trtanj, I.	2022	Croatia
12	Using computer-aided argument mapping to teach reasoning	DIG, PD, CT	Book chapter	Davies, W. M., Barnett, A. and van Gelder, T.	2021	Australia
13	The dialogic nature of regulation in collaborative digital argumentative writing practices	SOC, DIG	Journal article	De Castro Daza, D., Argote, Z. L. P. and Roncancio, N. R.	2022	Colombia
14	The case for scenario-based assessment of written argumentation	AS, CF	Journal article	Deane, P., Song, Y., van Rijn, P., O'Reilly, T., Fowles, M., Bennett, R., Sabatini, J. and Zhang, M.	2019	The USA
15	Critical Thinking Skills and Argumentative Writing Ability: Is there any Correlation?	CT, ED	Journal article	Ekalia, Y., Jemadi, F., Susanto, I. and Artikel, I.	2025	Indonesia
16	A SWOT analysis of ChatGPT: Implications for educational practice and research	DIG, AS	Journal article	Farrokhnia, M., Banihashem, S. K., Noroozi, O. and Wals, A.	2023	The Netherlands
17	Argumentative writing	CF, COG	Book chapter	Ferretti, R. P. and Fan, Y.	2016	The USA
18	Best practices in teaching argumentative writing	PD, CF	Book chapter	Ferretti, R. P. and Lewis, W. E.	2019	The USA

19	The case of a short intervention study of argumentative writing in engineering at two Colombian universities: Less is more	PD, DIG	Journal article	García, L., Calle, M., De Castro, A., Soto, J. D., Torres, L., Candelo-Becerra, J. E. and Schettini, N.	2020	Colombia
20	Analyzing engagement strategies in argument chain: A comparison between high- and low-scoring EFL undergraduate argumentative essays	ED, AS, L2	Journal article	Geng, Y., Chen, G. and Li, M.	2024	China
21	The impact of inquiry-based learning approach on critical thinking skill of EFL students	PD, CT, L2	Journal article	Ghaemi, F. and Mirsaeed, S.	2017	Iran
22	Problematizing argumentative writing in an Iranian EFL undergraduate context	CF, L2	Journal article	Ghanbari, N. and Salari, M.	2022	Iran
23	Disciplinary literacies and learning to read for understanding: A conceptual framework for disciplinary literacy	CF	Journal article	Goldman, S. R., Britt, M. A., Brown, W., Cribb, G., George, M., Greenleaf, C., Lee, C. D., Shanahan, C. and Project READI	2016	The USA
24	Understanding EFL students' chatbot-assisted argumentative writing: An activity theory perspective	DIG, SOC, L2	Journal article	Guo, K., Li, Y., Li, Y. and Chu, S. K. W.	2023	China
25	Using chatbots to scaffold EFL students' argumentative writing	DIG, PD, L2	Journal article	Guo, K., Wang, J. and Chu, S. K. W.	2022	China
26	Catch a tiger by the toe: Modal hedges in EFL argumentative paragraphs	ED, L2	Journal article	Hatipoğlu, Ç. and Algı, S.	2018	Turkey
27	The effects of a multicomponent strategy instruction on the argumentative writing performance of low-achieving secondary students	PD, ED	Journal article	Hisgen, S., Barwasser, A., Wellmann, T. and Grünke, M.	2020	Germany
28	Social perspective taking: A benefit of bilingualism in academic writing	COG, L2	Journal article	Hsin, L. and Snow, C.	2017	The USA

29	Epistemic modality in the argumentative essays of Chinese EFL learners.	ED, L2	Journal article	Hu, C. and Li, X.	2015	China
30	Insight from the association between critical thinking and English argumentative writing: Catering to English learners' writing ability	CT, ED	Journal article	Hu, Y. and Saleem, A	2023	China
31	Engaged at the first sight! Anticipating your audience as a way to think critically in writing an argument	CT, PD	Journal article	Hutasuhut, M. L., Chen, H. and Matruglio, E.	2023	Indonesia
32	Critical thinking in EFL students' argumentative writing: Manifestations and challenges.	CT, ED, L2	Journal article	Ilyas, H. and Arifin, S.	2025	Indonesia
33	Exploring the blended learning design for argumentative writing	DIG, PD	Journal article	Jin, T., Su, Y. and Lei, J.	2020	China
34	Thai EFL Students' Ability to Reason as Results of Training in Written Argumentation	PD, CT, L2	Journal article	Kaewneam, C.	2025	Thailand
35	The Impact of ChatGPT on Academic Writing Skills and Knowledge: An Investigation of Its Use in Argumentative Essays	DIG, ED	Journal article	Khampusaen, D.	2025	Thailand
36	Using evidence in L2 argumentative writing: A longitudinal case study across high school and university	ED, CT, L2	Journal article	Kibler, A. K. and Hardigree, C.	2017	The USA
37	The Challenge of Position-Taking in Novice Higher Education Students' Argumentative Writing	ED, PD	Journal article	Kleemola, K., Hyytinen, H. and Toom, A.	2022	Finland
38	Writing to learn	COG	Book chapter	Klein, P. D., Arcon, N. and Baker, S.	2016	Canada
39	Improving argumentative writing: effects of a blended learning approach and gamification	DIG, PD	Journal article	Lam, Y., Hew, K. and Chiu, K.	2018	China
40	An exploratory neuroimaging study of argumentative and summary writing	COG, DIG	Book chapter	Lamb, R., Hand, B. and Yoon, S. Y.	2019	The USA

41	Worked example or scripting? Fostering students' online argumentative peer feedback, essay writing and learning	DIG, PD, AS	Journal article	Latifi, S., Noroozi, O. and Talaei, E.	2020	Iran
42	Argument mining: A survey	DIG, COMP	Journal article	Lawrence, J. and Reed, C.	2020	The UK
43	CoAuthor: Designing a human-AI collaborative writing dataset for exploring language model capabilities	DIG, COMP	Conference paper	Lee, M., Liang, P. and Yang, Q.	2020	The USA
44	When teachers compare argumentative texts: Decisions informed by multiple complex aspects of text quality	AS	Journal article	Lesterhuis, M., Van Daal, T., Van Gasse, R., Coertjens, L., Donche, V. and De Maeyer, S.	2018	Belgium
45	Argument mapping as a pre-writing activity: Does it promote writing skills of EFL learners?	DIG, PD, L2	Journal article	Liu, Q., Zhong, Z. and Nesbit, J. C.	2023	Canada
46	A Pedagogical Framework for Teaching Chinese College English Learners' Argumentative Writing via Infusion of Critical Thinking	CT, PD	Journal article	Lu, C. and Swatevacharkul, R.	2021	Thailand
47	Improving university argumentative writing through online training	DIG, PD	Journal article	Luna, M., Villalón, R., Mateos, M. and Martín, E.	2020	Spain
48	Writing research from a cognitive perspective	CF, COG	Book chapter	MacArthur, C. A. and Graham, S.	2016	The USA
49	Which linguistic features predict quality of argumentative writing for college basic writers, and how do those features change with instruction?	AS, ED	Journal article	MacArthur, C. A., Jennings, A. and Philippakos, Z. A.	2019	The USA
50	The implementation of process approach combined with Screencast-O-Matic and BookCreator to improve students' argumentative writing	DIG, PD	Journal article	Maharani, A. A. P. and Santosa, M. H.	2021	Indonesia
51	Exploring the status of argumentative essay writing strategies and problems of Iranian EFL	ED, L2	Journal article	Mallahi, O.	2024	Iran

	learners					
52	Improving written argumentative synthesis by teaching integration of conflicting information.	COG, CT, PG	Journal article	Mateos, M., Martín, E., Cuevas, I., Villalón, R., Martínez, I. and González-Lamas, J.	2018	Spain
53	Corpus analysis on students' counter and support arguments in argumentative writing	ED, DIG	Journal article	McCarthy, P. M., Kaddoura, N. W., Al-Harthy, A., Thomas, A. M., Duran, N. D. and Ahmed, K.	2022	The United Arab Emirate
54	Enhancing argumentative writing via online peer feedback-based essay: A quasi-experiment study	PD, DIG	Journal article	Mulyati, Y. and Hadiananto, D.	2023	Indonesia
55	Metacognitive and critical thinking practices in developing EFL students' argumentative writing skills	COG, CT	Journal article	Murtadho, F.	2021	Indonesia
56	Dialogic vs. formalist teaching in developing argumentative writing discourse and reducing speaking apprehension among EFL majors	PD, SOC, L2	Journal article	Musa, H. I.	2019	Egypt
57	Engagement with and participation in online role play collaborative arguments: A sociocultural perspective	SOC, DIG	Journal article	Najjemba, J. L. and Cronjé, J.	2020	South Africa
58	Cognitive tools for scaffolding argumentation	DIG, PD	Journal article	Nesbit, J., Niu, H. and Liu, Q.	2019	Canada
59	Teaching and learning argumentative writing in high school English language arts classrooms	PD, AS	Book	Newell, G.	2015	The USA
60	Adaptive expertise in the teaching and learning of literary argumentation in high school English language arts classrooms	PD, SOC	Book chapter	Newell, G. E., Goff, B., Buescher, E., Weyand, L., Thanos, T. and Kwak, S. B.	2017	The USA
61	Unravelling Vietnamese students' critical thinking and its relationship with argumentative	CT, ED	Journal article	Nguyen, T. S. and Nguyen, H. B.	2020	Vietnam

	writing					
62	Assessment of students' argumentative writing: A rubric development	AS, ED	Journal article	Ozfidan, B. and Mitchell, C.	2022	The USA
63	Detected difficulties in argumentative writing: The case of culturally and linguistically Saudi backgrounded students	ED, L2	Journal article	Ozfidan, B. and Mitchell, C.	2020	The USA
64	A comparative study of stance and engagement used by English and Thai speakers in English argumentative essays	L2, ED	Journal article	Papangkorn, P. and Phoocharoensil, S. N.	2021	Thailand
65	Developing Rubric for Argumentative Writing Assessment Based on Multidimensional Approach	AS, PG	Journal article	Paris, A. S., Lustiyantie, N., Murtadho, F., Rosyidi, A. Z. and Suryadi, H.	2025	Indonesia
66	Critical thinking and argumentative writing: Inspecting the association among EFL learners in China	CT, L2	Journal article	Pei, Z., Zheng, C., Zhang, M. and Liu, F.	2017	China
67	A study of critical thinking's impact on English majors' argumentative writing	CT, SOC	Unpublished master's thesis	Qian, J.	2015	China
68	Importance of critical thinking in the education	CF, CT	Journal article	Raj, T., Chauhan, P., Mehrotra, R. and Sharma, M.	2022	India
69	Evaluation and promotion of argumentative reasoning among university students: The case of academic writing	CF, ED	Journal article	Rapanta, C. and Macagno, F.	2019	Portugal
70	Argument mapping with translanguaging pedagogy: A panacea for EFL students' challenges in writing argumentative essays	DIG, PD, L2	Journal article	Robillos, R. J. and Art-in, S.	2023	Thailand
71	Computer-aided argument mapping within metacognitive approach: Its effects on EFL learners' argumentative writing skill and self- regulation of learning	DIG, PD, COG, COMP	Journal article	Robillos, R. J. and Thongpai, J.	2022	Thailand

72	The effect of writing knowledge on EFL students' ability in composing argumentative essays	ED, L2	Journal article	Rubiaee, A. M., Darus, S. and Abu Bakar, N.	2019	Malaysia
73	Fostering the development of written argumentative competence in ELT from a critical literacy approach	SOC, PD, L2	Journal article	Sánchez-Peña, D. and Chapetón, C. M.	2018	Mexico
74	Solving the students' problems in writing argumentative essay through the provision of planning	PD, ED	Journal article	Setyowati, L., Sukmawa, S. and Latief, M. A	2017	Indonesia
75	Promoting and assessing EFL college students' critical thinking skills through argumentative essay writing	CT, AS, L2	Journal article	Sharadgah, T. A., Sa'di, R. A. and Ahmad, H. H.	2019	Saudi Arabia
76	Enhancing the use of evidence in argumentative writing through collaborative processing of content-based automated writing evaluation feedback	DIG, AS, PG	Journal article	Shi, Z., Liu, F., Lai, C. and Jin, T.	2022	China
77	Assessing the quality of arguments in students' persuasive writing: A case study analyzing the relationship between surface structure and substance	AS, Toulmin	Journal article	Stapleton, P. and Wu, Y.	2015	China
78	Collaborating with ChatGPT in argumentative writing classrooms	DIG, SOC	Journal article	Su, Y., Lin, Y. and Lai, C.	2023	China
79	Individual differences and micro-argumentative writing skills in EFL: An exploratory study at a Hungarian university	ED, L2	Book chapter	Tankó, G. and Csizér, K.	2018	Hungary
80	Integrating global Englishes into literature and writing units: Advice for secondary teachers	CF, PG	Book chapter	Thompson, V. E.	2021	The USA

81	Enhancing written communication skills for academic purposes. In Teaching English for academic purposes: Theory into practice	CF, PG, L2	Book chapter	Uzun, K.	2024	Turkey
82	Source use and argumentation behavior in L1 and L2 writing: A within-writer comparison	ED, CT	Journal article	van Weijen, D., Rijlaarsdam, G. and van den Bergh, H.	2019	The Netherlands
83	AL: An adaptive learning support system for argumentation skills	DIG, AS	Book chapter	Wambsganss, T., Niklaus, C., Cetto, M., Söllner, M., Handschuh, S. and Leimeister, J. M.	2020	Switzerland
84	Teaching and learning argumentative writing as critical thinking in an EFL composition classroom	PD, SOC, CT	Journal article	Wang, Q. and Newell, G. E.	2025	China
85	The Cognitive Challenges in Argumentative Writing for EFL Learners: A Scoping Review	COG, L2	Journal article	Wang, Y. and Said, S. M.	2024	Malaysia
86	The social construction of warranting evidence in two classrooms	SOC, ED	Journal article	Weyand, L., Goff, B. and Newell, G.	2018	The USA
87	Fostering critical thinking skills through argumentative writing	CT, PD	Journal article	Widyastuti, S.	2018	Indonesia
88	Fusion weighted features and BiLSTM-attention model for argument mining of EFL writing	COMP, DIG, L2	Journal article	Yang, J., Zheng, M. and Liu, Y.	2023	China
89	Focus and interaction in writing conferences for EFL writers	PD, AS, L2	Journal article	Yang, L.	2021	China
90	Appraisal resources in Chinese college students' English argumentative writing	ED, L2, COG	Journal article	Yang, Y.	2016	China
91	What does it mean to construct an argument in academic writing? A synthesis of English for general academic purposes and English for	CF, SOC	Journal article	Yasuda, S.	2023	Japan

	specific academic purposes perspectives					
92	Effects of training in the use of Toulmin's Model on ESL students' argumentative writing and critical thinking ability	PD, Toulmin, L2	Journal article	Zainuddin, Z. and Shammem, R. G.	2016	Malaysia
93	Writing critically 3: Argumentative writing	CF	Book	Zhang, L.	2016	New Zealand
94	Taking stock of a genre-based pedagogy: Sustaining the development of EFL students' knowledge of the elements in argumentation and writing improvement	PD, L2	Journal article	Zhang, T. and Zhang, L. J.	2021	New Zealand
95	EFL writers' reconstruction of writing beliefs in a functional linguistics-based curriculum: What does the trajectory look like?	COG, L2	Journal article	Zhang, X.	2019	China

Tags:

CF = Conceptual foundations / theory

CT = Critical thinking

ED = Empirical description of learner writing

PD = Pedagogy / teaching / instruction

AS = Assessment / evaluation

COG = Cognitive / metacognitive processes

SOC = Sociocultural / collaborative

DIG = Digital tools / AI / AWE / argument mapping

COMP = Computational / argument mining

L2 = EFL / multilingual focus

Appendix 2. Correlation between VOSviewer clusters and enlarged thematic clusters

Приложение 2. Корреляция между кластерами VOSviewer и расширенными тематическими кластерами

An enlarged thematic cluster	№ of a VOSviewer cluster	Key terms of the clusters (main ones)
(1) Theoretical and methodological foundations of argumentation in academic writing	Cluster 6	academic integrity, academic writing, eap (English for Academic Purposes), efl writing, scholarly communication, toulmin argument structure, written argumentation
	Cluster 7	argument quality, argumentation, argumentative structure, persuasive essay, self-efficacy, writing assessment
	Cluster 8	action research, argumentative writing skills, critical thinking, higher education, metacognition
	Cluster 9	appraisal resources, appraisal system, efl writers, interpersonal function, meaning making, systemic functional linguistics
(2) Assessment and analysis of argumentative writing	Cluster 13	argumentative writing, assessment, instruction, learning outcomes, rubric development, theory
	Cluster 14	comparative judgement, teachers' decision, text assessment, validity
	Cluster 15	corpus-based study, corpus-driven study, interactional metadiscourse, participant-oriented bundle
	Cluster 16	digital writing support, epistemic beliefs, technology-enhanced learning, writing-to-learn
(3) Sociolinguistic and interlinguistic aspects of argumentation	Cluster 4	appraisal theory, argument chain, argumentative essays, dialogic teaching, efl students, engagement, language development, mediation
	Cluster 10	adolescent literacy, bilingual advantage, language minority, perspective taking, persuasive writing, sociocognitive development
	Cluster 17	argumentation behavior, first language, second language, source use behavior
(4) Cognitive-psychological and educational determinants of argumentation	Cluster 1	adolescent, cognition, cognitive process, critical thinking disposition, learners' writing ability, predictive validity
	Cluster 2	academic performance, genre knowledge, genre-based writing, performance assessment, source-based writing
	Cluster 3	classrooms, cognitive processes, motivation, preservice teachers, problem solving, self-regulation, strategies, writing skills
	Cluster 5	feedback, grammar, reading ability, reading comprehension, school learning, spelling, syntax, written language

Appendix 3. Comparison of 3 Argument Models Приложение 3. Сравнение 3 моделей аргумента

Dimension	Classical Model	Toulmin Model	Rogerian Model
Core orientation	Rhetorical and genre-based organisation (Ozfidan and Mitchell, 2022; Zhang, 2016)	Analytical and logical reasoning (Stapleton and Wu, 2015; McCarthy et al., 2022)	Dialogic and consensus-oriented interaction (Musa, 2019; Hutasuhut et al., 2023)
Structural components	Exordium (introduction to engage the audience), narratio (background facts), propositio (main claim or thesis), proof (evidence and reasons), refutatio (counterarguments), and peroratio (conclusion and call to action) (Zhang, 2016; Ozfidan and Mitchell, 2022)	Claim (the assertion being made), data or grounds (evidence supporting the claim), warrant (the reasoning that connects data to claim), backing (additional support for the warrant), qualifier (indication of the degree of certainty), and rebuttal (acknowledgment of exceptions or counterarguments) (Zainuddin and Shammem, 2016; Stapleton and Wu, 2015)	Introduction establishing common ground, neutral summary of opposing views demonstrating empathy, presentation of one's own views and context, articulation of how one's position benefits all parties, and conclusion calling for consensus (Hutasuhut et al., 2023; Musa, 2019)
Organisation principle	Linear and sequential macro-structure (Zhang and Zhang, 2021)	Functional relations rather than linear sequence (McCarthy et al., 2022)	Non-adversarial, conciliatory progression (Musa, 2019)
Technology-enhanced applications	Limited explicit focus in the literature	Gamified and blended learning interventions improve engagement and reasoning (Lam et al., 2018; Jin et al., 2020)	AI-assisted scaffolding for perspective consideration (Guo et al., 2022, 2023; Su et al., 2023)
Cognitive focus	Macro-planning and rhetorical sequencing (Ferretti and Lewis, 2019)	Logical justification and evidential reasoning (Kibler and Hardigree, 2017; Mateos et al., 2018)	Social cognition, stance negotiation, empathy (Musa, 2019; Robillos and Art-in, 2023)
Pedagogical strengths and contributions	Supports coherence, audience awareness, and academic genre control for novice/EFL writers (Ferretti and Lewis, 2019; Zhang and Zhang, 2021)	Enhances critical thinking, warrant construction, evidence integration, and counterargument handling (Zainuddin and Shammem, 2016; Ghaemi and Mirsaeed, 2017; Hu and Saleem, 2023)	Develops empathy, perspective-taking, collaboration, and self-regulation (Robillos and Thongpai, 2022; De Castro Daza et al., 2022)
Limitations	Rigid structure; cultural mismatch; limited flexibility for advanced writers (Allen et al., 2019; Sharadgah et al., 2019; Kleemola et al., 2022)	Component ambiguity; underrepresentation of ethos/pathos; risk of mechanistic use (Stapleton and Wu, 2015; Ferretti and Lewis, 2019; Weyand et al., 2018)	High linguistic and time demands; limited suitability for high-stakes persuasive tasks (Papangkorn and Phoocharoensil, 2021; Almashour and Davies, 2023; Yasuda, 2023)
Best suited learner profile	Novice and lower-intermediate academic writers (Zhang and Zhang, 2021)	Intermediate to advanced learners developing analytical competence (Hu and Saleem, 2023)	Higher-proficiency learners in collaborative and intercultural contexts (De Castro Daza et al., 2022)

Appendix 4. Mapping sources to dimensions

Приложение 4. Сопоставление источников с параметрами

№	Source	Structural adequacy	Dialogic engagement	Rhetorical organisation	Comment
1	Abdollahzadeh et al., 2017	+			Structural argumentative behaviour in EFL writing
2	Akib et al., 2024	+		+	Critical thinking assessed via structural and coherence criteria
3	Almashour and Davies, 2023	+			Learning strategies affecting argumentative performance
4	Al-Otaibi and Hussain, 2024			+	Interactional metadiscourse and stance markers
5	Allen et al., 2019	+		+	Multidimensional textual features predicting quality
6	Amini Farsani et al., 2025	+	+	+	Systematic review integrating multiple operationalisations
7	Arroyo González et al., 2020	+			Structural predictors of argument quality
8	Athanasēs et al., 2015		+	+	Classroom inquiry and rhetorical adaptation
9	Benetos and Bétrancourt, 2020	+			Digital authoring support targeting argument structure
10	Cheong et al., 2021	+		+	Source-based reasoning and rhetorical integration
11	Cvikić and Trtanj, 2022			+	Causal linguistic realisation in argumentation
12	Davies et al., 2021	+			Computer-aided argument mapping (structural reasoning)
13	De Castro Daza et al., 2022		+		Dialogic regulation in collaborative writing
14	Deane et al., 2019	+			Scenario-based structural assessment
15	Ekalia et al., 2025	+			Critical thinking correlation with structural ability
16	Farrokhnia et al., 2023	+			AI implications for academic writing performance
17	Ferretti and Fan, 2016	+			Cognitive and structural account of argumentation
18	Ferretti and Lewis, 2019	+		+	Instruction grounded in structural and persuasive organisation
19	García et al., 2020	+		+	Intervention improving structural and rhetorical quality
20	Geng et al., 2024		+	+	Engagement strategies and dialogic positioning
21	Ghaemi and	+			Inquiry-based improvement of

	Mirsaeed, 2017				reasoning
22	Ghanbari and Salari, 2022	+		+	Structural and rhetorical weaknesses in EFL writing
23	Goldman et al., 2016			+	Disciplinary literacy and rhetorical framing
24	Guo et al., 2023	+	+		Chatbot scaffolding for argumentative reasoning and positioning
25	Guo et al., 2022	+			AI scaffolding of structural components
26	Hatipoğlu and Algi, 2018			+	Hedging and modal stance
27	Hisgen et al., 2020	+			Strategy instruction enhancing structure
28	Hsin and Snow, 2017		+		Social perspective-taking in academic writing
29	Hu and Li, 2015			+	Epistemic modality in argumentation
30	Hu and Saleem, 2023	+			Critical thinking–argument structure association
31	Hutasuhut et al., 2023		+		Audience anticipation and dialogic engagement
32	Ilyas and Arifin, 2025	+			Structural manifestations of reasoning
33	Jin et al., 2020	+	+		Blended learning fostering structure and interaction
34	Kaewneam, 2025	+			Training effects on reasoning ability
35	Khampusaen, 2025	+	+		AI-assisted argumentative writing and positioning
36	Kibler and Hardigree, 2017	+		+	Evidence integration and rhetorical development
37	Klein et al., 2016	+			Writing-to-learn cognitive structuring
38	Kleemola et al., 2022		+		Position-taking in novice writers
39	Lamb et al., 2019	+			Cognitive processes in argumentative production
40	Lam et al., 2018	+			Gamified/blended support of argument structure
41	Latifi et al., 2020	+	+		Peer feedback enhancing dialogic reasoning
42	Lawrence and Reed, 2020	+			Argument mining (structural computational focus)
43	Lee et al., 2022	+	+		Human–AI collaborative writing (structure and interaction)
44	Lesterhuis et al., 2018	+		+	Rubric-based multi-aspect evaluation

45	Liu et al., 2023	+			Argument mapping as structural scaffold
46	Lu and Swatevacharkul, 2021	+			Critical thinking infused into structure
47	Luna et al., 2020	+			Online intervention targeting structural quality
48	MacArthur and Graham, 2016	+			Cognitive-structural model of writing
49	MacArthur et al., 2019	+		+	Linguistic predictors and textual organisation
50	Maharani and Santosa, 2021	+			Process approach improving argumentative structure
51	Mallahi, 2024	+			Writing strategies and structural problems
52	Mateos et al., 2018	+	+		Integrating conflicting information dialogically
53	McCarthy et al., 2022	+	+		Corpus analysis of support and counterarguments
54	Mulyati and Hadiano, 2023	+	+		Peer feedback enhancing dialogic and structural quality
55	Musa, 2019		+	+	Dialogic vs formalist teaching approaches
56	Murtadho, 2021	+			Metacognition supporting structural development
57	Najjemba and Cronjé, 2020		+		Online role-play dialogic argumentation
58	Nesbit et al., 2019	+			Cognitive tools for structuring argument
59	Newell et al., 2015		+	+	Classroom dialogic argumentation practices
60	Newell et al., 2017		+	+	Literary argumentation and adaptive expertise
61	Nguyen and Nguyen, 2020	+			Critical thinking and argumentative performance
62	Ozfidan and Mitchell, 2020	+			Structural difficulties in L2 argumentation
63	Ozfidan and Mitchell, 2022	+		+	Rubric development combining structure and organisation
64	Papangkorn and Phoocharoensil, 2021		+	+	Stance and engagement analysis
65	Paris et al., 2025	+		+	Multidimensional assessment rubric
66	Pei et al., 2017	+			Critical thinking and structural argument quality

67	Qian, 2015	+			Impact of CT on structural writing
68	Raj et al., 2022	+			Conceptual link CT–argument structure
69	Rapanta and Macagno, 2019	+			Toulmin-based evaluation of reasoning
70	Robillos and Artin, 2023	+	+		Argument mapping with dialogic pedagogy
71	Robillos and Thongpai, 2022	+			Computer-aided argument mapping
72	Rubiaee et al., 2019	+			Writing knowledge predicting structural quality
73	Sánchez-Peña and Chapetón, 2018		+	+	Critical literacy and dialogic stance
74	Setyowati et al., 2017	+			Planning improving structure
75	Sharadgah et al., 2019	+			Critical thinking through argumentative writing
76	Shi et al., 2022	+		+	Automated feedback on evidence integration
77	Stapleton and Wu, 2015	+			Structural assessment (claims/evidence)
78	Su et al., 2023	+	+		ChatGPT collaboration affecting structure and engagement
79	Tankó and Csizér, 2018	+			Micro-argumentative structural skills
80	Thompson, 2021			+	Rhetorical positioning in global Englishes
81	Uzun, 2024			+	Academic genre conventions
82	van Weijen et al., 2019	+		+	Source use and rhetorical integration
83	Wang and Newell, 2025	+	+		Critical thinking through classroom dialogue
84	Wang and Said, 2024	+			Review of cognitive challenges in EFL writing
85	Wambsganss et al., 2020	+			Adaptive learning support system for argument structure
86	Weyand et al., 2018	+	+		Social construction of warranting evidence
87	Widyastuti, 2018	+			CT fostering argumentative quality
88	Yang et al., 2023	+			Computational argument mining
89	Yang, 2021		+	+	Interactional focus in writing conferences
90	Yang, 2016			+	Appraisal resources and stance
91	Yasuda, 2023			+	Genre-based conceptualisation of

					academic argument
92	Zainuddin and Shammem, 2016	+			Toulmin-based training intervention
93	Zhang, 2016			+	Genre-based argumentative instruction
94	Zhang and Zhang, 2021			+	Genre pedagogy synthesis
95	Zhang, 2019			+	Functional linguistics and rhetorical beliefs

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Chen Limin¹ 

Diachronic representation of rural China in mainstream Chinese news media: A corpus-assisted discourse analysis

¹ Guilin Tourism University
26 Liangfeng Rd., Yanshan District, Guilin city, 541000, China
E-mail: clm@gltu.edu.cn
ORCID: 0009-0000-7102-6572

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Abstract: This study presents a comprehensive corpus-assisted discourse analysis that examines the diachronic representation of rural China in *People's Daily* from 2000 to 2025, utilizing the Discourse-Historical Approach (DHA). The research is based on a systematically constructed corpus of 1,739 news reports, which are categorized into three distinct phases aligned with major national policy shifts: rural governance reforms (2000-2005), new socialist countryside construction (2005-2017), and comprehensive rural revitalization (2017-2025). The analysis identifies a clear evolutionary trajectory in media discourse, with thematic focus progressing from basic governance and institutional reforms to systematic rural construction and finally to holistic revitalization. Furthermore, it reveals two key discursive transformations. First, nomination strategies shift from administrative terminology ("rural areas") to culturally rich concepts ("countryside"), reflecting a reconceptualization of rural space. Second, perspectivization expands from exclusively government-oriented narratives to incorporate diverse voices, including local actors, enterprises, and international observers. These discursive shifts demonstrate a close alignment with China's national rural policy evolution, illustrating how state-aligned media discourse actively constructs and legitimizes policy agendas while responding to sociopolitical changes. The findings contribute to understanding the dynamic relationship between media representation, policy implementation, and formation of public perception in contemporary China's rural transformation. Notably, this study makes a unique contribution to corpus-assisted discourse analysis by demonstrating how the integration of diachronic corpus data with the DHA framework can systematically unveil and interpret nuanced linguistic and discursive adaptations that mirror and reinforce macro-level sociopolitical transformations.

Keywords: Rural China; Media representation; Discourse-historical approach; Diachronic approach; Corpus-assisted discourse analysis

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Introduction

The past few decades have witnessed remarkable transformations in Chinese society. With the rapid growth of its economic strength, there has been a significant decline in the rural population. In 2007, more than

714 million people resided in rural areas of China, but by 2020, this figure had dropped to approximately 509 million (Xia et al., 2022). Notwithstanding the still substantial size of the rural population, China has achieved notable success in poverty alleviation, lifting

nearly 100 million individuals out of poverty, the majority of whom originating from these rural regions. Successive national policy frameworks targeting rural development have been implemented throughout the new century. Major initiatives include the Building a New Socialist Countryside campaign and the subsequent comprehensive Rural Revitalization Strategy (Pan, 2024). As a result, rural China has undergone profound changes, shaped by both demographic shifts and policy-driven measures.

The transformation of rural China presents a compelling academic locus for inquiry: how social realities and social changes are discursively constructed in China's mainstream media? This study hence focuses on the diachronic representation of rural China in Chinese domestic news media, to examine whether and how the changes of rural China have been discursively constructed. This examination is essential, as discourse around rural China has undergone major shifts along with China's social changes. Historically, the rural landscape served as a crucial epistemological foundation for Chinese intellectuals, providing fertile ground for reevaluating social, moral, and ethical constructs (Zhang, 2014). In Western academia, there was even an academic trend towards China Study before the 1980s referred as "rural preoccupation" (Lee and Li, 1999), indicating that research on China at that time was largely rural-oriented. However, with China's rapid strides in modernization and industrialization, scholarly and public focus has increasingly shifted towards urbanization, megacities, and economic growth (Cao, 2012; Neo and Pow, 2015; Rozelle and Hell, 2020), marginalizing rural narratives and rendering rural China an invisible entity in public consciousness (Rozelle and Hell, 2020). This trend has since reversed in recent years with China's remarkable success in the poverty alleviation campaign, which targeted rural areas, and the subsequent launch of the rural revitalization strategy. These initiatives have not only boosted rural development but also reignited

public interest in rural China, highlighted the renewed importance of rural narratives in national discourses.

Against this backdrop, the discursive construction of rural China has become an even more crucial issue. Previous research on rural China was dominated by sociological, anthropological, and historical approaches (Zhang, 2020), with limited linguistic scrutiny of how rural China is discursively constructed. While studies have investigated rural imagery in literature, film, and short videos (e.g., Peng and Fang, 2018; Yang, 2018; Fang, 2020; Weng and Liu, 2022), the language used to construct it was largely ignored. In recent years, some scholars have examined the representation of rural China in news media, including in foreign news media (e.g., Pan, 2024; Lu et al., 2024) and Chinese English-language newspapers aiming at international publicity (e.g. Zhu et al., 2024; Chen, 2022). While these studies offered valuable insights, how rural China is represented in national Chinese-language newspapers targeting domestic audiences is under-explored. Unlike Chinese English-language media, which primarily serves as a tool for international communication and external propaganda, Chinese-language newspapers are more deeply embedded in the daily lives of the Chinese populace and exert a more direct and immediate influence on domestic audiences' understanding of rural issues. Therefore, investigating the discourse around rural China in Chinese-language mainstream media is essential for comprehensively understanding the multifaceted representation of rural China in contemporary discourse.

This study aims to conduct a corpus-assisted study to examine discourses around rural China in mainstream Chinese-language news media, *People's Daily* (人民日报), with a specific focus on the news reporting of rural China during 2000 to 2025. State-affiliated media outlets, such as *People's Daily*, play a central role in shaping public perceptions of rural issues. Examining discourse from the start of the new century will provide insight

into whether and how the discourse of rural China has changed over time. Unlike qualitative approaches, a corpus-assisted study enables systematic identification of lexical patterns and discursive strategies at a large scale, offering empirical insights into how rural China is linguistically constructed in state-aligned media. Three research questions (RQs) are raised to guide this study.

RQ1: What themes emerge from the three sub-corpora respectively?

RQ2: How rural China is discursively constructed in different phases?

RQ3: What is the sociopolitical context and ideology behind such constructions?

Literature review

Rural China, media, and representation

Rural China represents an important site to trace the development of China. As Fei (1992: 1), a famous Chinese sociologist, states that “Chinese society is fundamentally rural”, highlighting the deep-seated connection between the rural landscape and the core of Chinese civilization. This perspective is further supported by Zhao (2010), who traces the origins of China’s agricultural civilization back tens of thousands of years, showcasing the enduring legacy of rural practices that have shaped the nation’s identity. Netting (1993) also emphasizes that China’s massive rural population, engaged in intensive farming, is unparalleled globally, reinforcing the significance of rural China on the world stage. Visser (2010) echoes this notion by asserting that rural China embodies authentic Chinese society, with the rural serving as a microcosm of the nation’s values, traditions, and social structures. Even today, despite China’s rapid modernization, the rural population remains substantial. Given this, media representations of rural China carry substantial weight as they shape public perceptions of a sector intricately tied to national identity.

The media, particularly state-affiliated news outlets, play a pivotal role in constructing these perceptions. News media

exert influence through agenda-setting (McCombs and Shaw, 1972; McCombs, 2005), selectively highlighting or silencing aspects of rural life to align with institutional stances (Li, 2009). This process is not neutral as media actively reshape reality through linguistic and discursive strategies (Hall, 1997; Fürsich, 2010), a dynamic intensified in state-aligned media like *People’s Daily*, which serves as a key channel for national discourse.

Representation, defined as “the production of meaning through language” (Hall, 1997: 16), operates via signs to construct conceptualizations of rural China. Discursive strategies, such as emphasizing development achievements or cultural traditions (Li, 2009; Yang and Chen, 2021), frame rural areas in ways that reflect sociopolitical priorities. For state media, these representations are not merely descriptive but symbolic tools to legitimate policy agendas, making the discursive construction of rural China a critical lens into state-society dynamics.

Past studies on the representation of rural China

Existing research on rural representation spans diverse media forms, but gaps remain in examining discursive mechanisms in domestic mainstream newspapers. In literary studies, rural imagery has been interpreted through binary frameworks (“demonization” vs. “pastoralization”) (Cao, 2012) or functional symbolism (Nan, 2019), while new-century works focus on modernization-driven transformations (Li, 2014). However, these analyses prioritize thematic content over linguistic construction. In visual media, representations of rural areas have shifted with national agendas, with works in 1980s stereotyping rural areas as poverty-stricken, narratives in 1990s emphasizing social bonds, and 21st-century texts aligning with “new socialist countryside” and “rural revitalization” initiatives (Ji and Wu, 2014). Yet such studies rarely dissect linguistic strategies underpinning these shifts. Newspaper coverage reveals divergent narratives tied to media orientation.

Mainstream party newspapers, especially during rural revitalization, portray positive rural images aligned with national agendas (Fang, 2020; Ouyang, 2018), while metropolitan newspapers stigmatize rural areas as underdeveloped (Luo, 2011). International media, such as *The New York Times*, consistently frame rural China negatively (Pan, 2024), contrasting sharply with domestic narratives.

Discourse analysis and corpus linguistics have been increasingly employed as effective approaches to decoding media representation of rural China. Several studies have utilized corpus linguistics to identify patterns in media discourse. For instance, Chen (2022) conducts a corpus analysis of *China Daily* headlines (2001-2021), finding that economic development is the most frequently discussed factor in rural transformation, and notes the media's relative objectivity in addressing negative issues. Another diachronic corpus-based study by Pan (2024) on *The New York Times* (1980-2024) reveals a consistent, negative representation of rural China as impoverished and problematic across decades, with a focus on issues like disease and women's status, demonstrating little change despite China's internal developmental shifts. The DHA has also been applied to unpack the discursive strategies in rural reporting. For example, Sun and Li (2025) use DHA to analyze *China Daily*'s economic news on rural revitalization, identifying how nomination, predication, and argumentation strategies construct a positive, modern, and innovative image of the new countryside for international audiences. Similarly, Li and Li (2024) apply DHA to a single report from *People's Daily Online*, detailing how nomination, predication, and argumentation strategies are employed to frame the roles of the government, society, and individuals in promoting rural revitalization through digital commerce.

Recent research also shows efforts to integrate corpus methods with other theoretical frameworks. Zhu, Liu, and Xu (2024) combine corpus-assisted discourse

studies with Harmonious Discourse Analysis (HDA) to examine *China Daily*'s reports on rural revitalization. They argue that the outlet constructs a harmonious, green, and people-oriented rural image by adhering to HDA's principles, using a constructive reporting framework and authenticity discourse strategies. From a broader perspective, Lu and de Vries (2022) perform a large-scale keyword analysis of Chinese academic publications (1981-2020), distilling eight dominant rural development paradigms over four decades and interpreting discursive shifts concerning actors, places, and activities, highlighting the duality in current rural development discourse.

Collectively, these recent studies underscore a heightened academic interest in the discursive construction of rural China and demonstrate the utility of corpus-assisted and discourse-historical methodologies. However, a significant gap remains. While existing research has effectively analyzed international media portrayals (e.g., Pan, 2024) and the external propaganda functions of Chinese English-language media (e.g., Chen, 2022; Sun and Li, 2025; Zhu et al., 2024), the discursive construction of rural China in domestic Chinese-language mainstream newspapers is under-explored. Studies focusing on domestic outlets like *People's Daily* are fewer and often lack a systematic, diachronic, and corpus-assisted examination of the linguistic strategies underpinning representation shifts across key policy phases. This study aims to address this gap.

Methods

Data collection and corpus construction

The corpus of this study was constructed from news reports extracted from the China National Knowledge Infrastructure (CNKI) database, following a systematic procedure to ensure relevance and quality. The retrieval was conducted in CNKI with the following criteria: the title of the reports must contain either “农村” (rural areas) or “乡村” (villages). Only reports published in the Chinese-language *People's Daily* were

included, as it serves as a key official media outlet in China, ensuring the representativeness of state-aligned discourse on rural-related issues.

After initial retrieval, the collected reports were subjected to strict screening to exclude irrelevant or low-quality materials. Reports whose titles did not explicitly include “农村” (rural areas) or “乡村” (villages) were eliminated. Texts primarily focusing on topics unrelated to rural China (e.g., urban policies, international affairs) were excluded. Duplicate reports (i.e., identical content published on different dates) were removed to avoid redundancy. Materials consisting solely of images without textual content were discarded. The reports in CNKI span from the earliest one dated May 12, 2000, to the latest one retrieved on July 4, 2025. In total, 1,739 files were identified as valid.

As this study aimed to explore and reveal the changes of rural China in the 21st century, the timeframe of interest was divided into three phases. The first phase started from May 12, 2000 to October 11, 2005, the second from October 12, 2005 to October 18, 2017, and the third from October 19, 2017 to July 4, 2025. October 11, 2005 marks the official proposal of the Building a New Socialist Countryside campaign, and October 19, 2017 corresponds to the inclusion of the “Rural Revitalization Strategy” in the report of the 19th National Congress. All the valid reports were downloaded in chronological order, and then categorized into three sub-corpora aligned with the defined phases (see Table 1).

Next the files were converted into plain text (.txt) format to standardize the corpus and enable compatibility with corpus analysis software. Irrelevant information (e.g., headers, footers, and page numbers) was manually removed to ensure the corpus contained only substantive content of the reports.

The three sub-corpora were imported into a corpus analysis software and were processed respectively, including extraction of keywords, high-frequency words and multiword expressions. The software chosen for corpus analysis was Sketch Engine. Sketch Engine was a powerful corpus analysis tool with multiple functions, including word sketch, word sketch difference, wordlist, keyword, and N-grams, which help identify lexical patterns to support analysis of themes and discursive strategies. Most importantly, Sketch Engine can process multiple languages including Chinese (Kilgariff et al., 2014), which makes it an appropriate tool for the current corpora. Recent studies have utilized Sketch Engine to analyze Chinese corpora (Xu, 2021). For the extraction of keywords, a built-in Chinese corpus (Chinese Web 2017 (zhTenTen17) Simplified) containing 18,353,895,474 tokens, was served as a reference corpus. The statistical significance of each keyword was determined by calculating the log-likelihood value using the Log-likelihood calculator developed by researchers from Beijing Foreign Studies University (BFSU) (Ming-xia, 2021).

Table 1. Corpora composition

Sub-corpus	Period	Number of articles	Tokens
Phase 1	May 12, 2000 – Oct 11, 2005	365	300,305
Phase 2	Oct 12, 2005 – Oct 18, 2017	904	859,459
Phase 3	Oct 19, 2017 – Jul 4, 2025	470	658,437

Analytical framework: The discourse-historical approach (DHA)

This study adopted the Discourse-Historical Approach (DHA), a major variant of Critical Discourse Analysis (CDA) developed by Ruth Wodak and her colleagues

(Reisigl and Wodak, 2009; Wodak, 2015). DHA is rooted in the premise that discourse is not merely a reflection of social reality but a context-dependent symbolic practice deeply embedded in historical, social, and political structures. It aims to unpack the interplay

between language, power, and ideology by integrating historical sources, sociopolitical contexts, and linguistic analyses, thereby revealing how discursive practices construct, maintain, or challenge social identities, relations, and inequalities (Wodak, 2009).

DHA involves identifying the key themes, topics, or content of the target discourse. This step focuses on what is being communicated. For example, the central issues, events, or social actors highlighted in the texts. By mapping dominant and marginalized topics, researchers can discern the primary focuses of the discourse and their alignment with broader social or political agendas (Liang et al., 2024). In this study, this dimension will involve extracting recurring themes related to rural China from *People's Daily* reports, to establish the foundational content of rural discourse.

DHA emphasizes five interrelated discursive strategies through which meaning is constructed and legitimized (Reisigl and Wodak, 2009; Wodak, 2015), including nomination, predication, argumentation, perspectivization, and

intensification/mitigation (see Table 2). For this study, we focused on the two strategies of nomination and perspectivization. The primary reason for this selective focus is that these two strategies are most directly pertinent to capturing the core discursive shifts in the representation of rural China as framed by our research questions. Nomination, concerning the linguistic labeling of social actors/objects, directly reflects evolving conceptualizations and policy orientations towards rural space. Perspectivization, concerning the framing of discourse through specific viewpoints, directly reveals shifts in whose voices and perspectives dominate the discourse. While argumentation, predication, and intensification/mitigation are valuable for analyzing evaluative and justificatory aspects, nomination and perspectivization provide unique lens for examining the constitutive naming and framing mechanisms in the diachronic construction of rural representations, which is the central aim of this analysis.

Table 2. Discursive strategies and their descriptions

Discursive Strategies	Description
Nomination	The linguistic labeling or categorization of social actors, objects, or phenomena, which serves to draw boundaries between “ingroups” and “outgroups”
Predication	The attribution of positive or negative traits, evaluations, or characteristics to the nominated entities
Argumentation	The use of rhetorical “topoi” (e.g., topos of threat, topos of progress) to justify or challenge evaluations, thereby legitimizing specific viewpoints
Perspectivization	The framing of discourse through specific viewpoints to emphasize or downplay certain perspectives
Intensification/ Mitigation	The strengthening or weakening of evaluative claims through linguistic devices

The two strategies of nomination and perspectivization employed by the news reports were detected by using corpus tools. Specifically, nomination was identified by analyzing keywords and high-frequency n-grams extracted via Sketch Engine. Changes

in the most salient and frequent nouns and multi-word nominations across the three phases are taken as indicators of shifting labels and categories assigned to rural entities, revealing changes in conceptual emphasis and policy alignment. Perspectivization was

investigated by examining high-frequency verbs related to verbal processes and their concordance lines. Analyzing the grammatical subjects (who is speaking) and the content surrounding these verbs in context allows us to identify the primary actors granted a and the typical forms of their discursive contributions, thereby mapping the distribution of discursive perspective and authority over time.

A defining feature of DHA is its emphasis on situating discourse within broader historical trajectories and sociopolitical contexts (Wodak, 2015). This includes analyzing how past discourses, policy, and social changes shape current representations (Zhao, 2017). By contextualizing *People's Daily* reports within China's rural development policies and demographic shifts, this study will explain why certain discursive patterns emerge or evolve over time.

By adopting DHA, this study moves beyond descriptive analysis of media content to reveal the how and why of rural China's discursive construction in state-aligned media. It enables systematic examination of both macro-level contextual influences (e.g., policy agendas) and micro-level linguistic practices (e.g., lexical choices), offering a holistic understanding of how rural discourse reflects and reinforces social changes in China.

Results

Thematic evolution: From "rural basic governance" to "comprehensive rural revitalization"

Based on the analysis of keywords (see Table 3), 3-4 grams (see Table 4), and high-frequency nouns (see Table 5) across the three phases, the core themes of rural China exhibit a clear diachronic progressive feature, echoing the shifts in China's rural development policies.

Table 3. Keywords for each phase

Phase	Keywords (top 5)	Frequency	Log-likelihood
1	税费改革 (tax and fee reform)	290	3655.49
	农村税费 (rural tax and fee)	247	3336.95
	农村卫生 (rural health)	271	3300.14
	农村税费改革 (rural tax and fee reform)	236	3212.78
	农村卫生工作 (rural health work)	130	1939.04
2	新农村 (new countryside)	2599	22675.10
	农村建设 (rural construction)	1558	18330.80
	农村基层 (rural grassroots)	716	6392.07
	农村改革 (rural reform)	516	5100.09
	农村改革发展 (rural reform and development)	196	2330.92
3	乡村治理 (rural governance)	375	3768.29
	乡村产业 (rural industries)	314	3423.79
	攻坚成果 (poverty alleviation achievements)	272	2785.76
	农村现代化 (rural modernization)	234	2626.61
	农业农村现代化 (rural construction)	215	2488.91

Phase 1 centers on rural basic governance and institutional reforms. The corpus analysis identifies high-frequency nouns such as *rural areas*, *farmers*, and *agriculture*. More importantly, the keyword analysis (see Table 3) reveals terms with

exceptionally high log-likelihood (LL) values, such as *tax and fee reform* (LL=3655.49), *rural tax and fee* (LL=3336.95), and *rural health* (LL=3200.14), confirming their statistical salience as core discursive foci beyond mere frequency. These keywords

specify the discourse focus on policy-driven reforms. Keywords and n-grams like *rural tax and fee reform* and *Three Represents* further specify the discourse focus. From a DHA perspective, this thematic construction reflects the immediate socio-political context of alleviating peasant burdens and stabilizing grassroots governance, framing the state in the role of a problem-solver.

Phase 2 shifts to the theme of Building a New Socialist Countryside. The discourse undergoes a strategic shift corresponding to the 2005 policy initiative. The rise of the noun *construction* and the dominance of keywords with high statistical keyness, such as *new countryside* (LL=22675.10) and *rural construction* (LL=18330.80), indicate a thematic expansion from basic governance to systematic, holistic rural transformation. High-frequency n-grams like *new countryside construction* and *new socialist countryside* also signify such an expansion. This shift in

thematic focus, as revealed by the corpus, exemplifies how media discourse operationalizes a new policy framework, constructing the state as an architect of balanced urban-rural development.

Phase 3 focuses on rural revitalization and agricultural and rural modernization. The thematic upgrade is most notably signaled by the high-frequency noun *countryside* surpassing *rural areas*. Keywords with high statistical significance such as *rural governance* (LL=3768.29), *rural industries* (LL=3423.79) and high-frequency n-grams like *promote rural revitalization* underscore a connotative expansion. The discourse thematically constructs rural space not just as an administrative or economic unit but as a holistic entity integrating economic, cultural, ecological, and social dimensions, legitimizing the comprehensive goals of the Rural Revitalization Strategy.

Table 4. High-frequency 3-4 grams in each phase

Phase	3-4 Grams
1	Original: 农村税费改革, 三个代表, 农业和农村, 农村合作医疗, 新型农村合作, 新型农村合作医疗, 和农村经济, 农业和农村经济, 农村卫生工作, 农村义务教育 Translation: rural tax and fee reform, Three Represents, agriculture and rural areas, rural cooperative medical care, new-type rural cooperation, new-type rural cooperative medical care, and rural economy, agriculture and rural economy, rural health work, rural compulsory education
2	Original: 新农村建设, 社会主义新农村, 建设社会主义新, 建设社会主义新农村, 社会主义新农村建设, 农村建设的, 新农村建设的, 经济社会发展, 基层党组织, 先进性教育活动 Translation: new countryside construction, new socialist countryside, building a new socialist, building a new socialist countryside, construction of new socialist countryside, of rural construction, of new countryside construction, economic and social development, grassroots party organizations, advanced education campaign
3	Original: 推进乡村振兴, 乡村全面振兴, 乡村振兴战略, 全面推进乡村, 全面推进乡村振兴, 乡村振兴的, 脱贫攻坚成果, 农村人居环境, 实施乡村振兴, 高质量发展 Translation: promoting rural revitalization, comprehensive rural revitalization, rural revitalization strategy, comprehensively promoting rural areas, comprehensively promoting rural revitalization, of rural revitalization, achievements of poverty alleviation, rural living environment, implementing rural revitalization, high-quality development

Discursive strategies: Dynamic adjustment of nomination and perspectivization

Nomination strategy: Symbolic reconstruction from rural areas to countryside

The nomination strategy, through the labeling of rural-related entities, reflects changes in policy orientation and social cognition. The nomination strategies were identified based on the keywords (see Table 3) and high-frequency nouns (see Table 5).

Phase 1 centers on labels such as *rural areas* and *farmers*, supplemented by vocabulary from specific fields like *agriculture* and *taxes and fees*. It emphasizes rural areas as an administrative and economic unit relative to urban areas, highlighting its attribute of needing support and transformation (e.g., *rural drinking water difficulties*, *rural tax and fee reform*). During Phase 2, *new countryside* emerges as the core nomination. The adjective *new* endows rural development with initiative and systematicity, while *new socialist countryside* clarifies its ideological attribute, integrating rural construction into the national overall

development framework. Phase 3 witnesses *countryside* replacing *rural areas* as a high-frequency noun. Nominations such as *rural governance* and *rural industries* weaken administrative overtones and strengthen the integrity of *countryside* as a natural, cultural, and social community (e.g., *rural culture*, *rural tourism*), echoing the policy positioning of livable, industry-friendly, and beautiful countryside.

The nomination changes from *rural areas* to *countryside* is a notable phenomenon, as rural areas are traditionally an administrative and economic concept, emphasizing rural regions as counterparts to urban areas in the urban-rural binary framework. It is closely associated with agricultural production, grassroots governance, and material conditions. In contrast, *countryside* carries richer cultural, ecological, and social connotations, transcending mere administrative boundaries. It integrates natural landscapes, traditional culture, and community life, aligning with holistic development goals such as cultural inheritance, ecological protection, and livability.

Table 5. High-frequency nouns in each phase

Phase	Nouns
1	Original: 农村, 农民, 工作, 农业, 教育, 经济, 建设, 发展, 改革, 地区 Translation: rural areas, peasants, work, agriculture, education, economy, construction, development, reform, region
2	Original: 农村, 农民, 建设, 农业, 发展, 工作, 社会, 村, 经济, 教育 Translation: rural areas, peasants, construction, agriculture, development, work, society, village, economy, education
3	Original: 乡村, 农村, 农业, 村, 产业, 建设, 发展, 农民, 服务, 工作 Translation: countryside, rural areas, agriculture, village, industry, construction, development, peasants, service, work

Perspectivization strategy: Distribution of discourse power from “government-led” to “multi-party participation”

The perspectivization strategy constructs the dominant perspective of different stages through the selection of discourse subjects (who is speaking) and expression forms (how to speak), whose

characteristics can be summarized through the analysis of concordance lines of verbs such as *said*, *proposed*, *emphasized*, and *pointed out*. The perspectivization strategy was identified by examining the high-frequency verbal verbs (see Table 6) and their concordance lines (see Table 7).

Table 6. High-frequency verbal verbs related to perspectivization in each phase

Phase	Verbal verbs
1	Original: 说, 提出, 强调, 指出 Translation: said, proposed, emphasized, pointed out
2	Original: 说, 提出, 强调, 指出 Translation: said, proposed, emphasized, pointed out
3	Original: 说, 介绍, 提出, 表示, 强调 Translation: said, introduced, proposed, expressed, emphasized

Phase 1 highlights discourse led by the government and grassroots cadres. The discourse subjects are mainly government officials (e.g., Vice Minister of Water Resources Zhai Haohui, President Hu Jintao) and rural grassroots cadres (e.g., Yan Hongchang, director of Xiaogang Village Committee). The subjects of *proposed* are mostly central departments (e.g., the Ministry of Education, the central government), while *emphasized* and *pointed out* focus on central meetings and leaders (e.g., the meeting, Hu Jintao). This forms a top-down policy communication perspective, highlighting the state's leading role in rural reform (e.g., the promotion of tax reforms).

Phase 2 signals participation of local and multi-party subjects in the discourse. The discourse subjects expand to local governments (e.g., Cui Jiangshui, Secretary of Handan Municipal Party Committee), enterprise leaders (e.g., Wang Mengtang, Chairman of Zhongdao Industrial Company), and environmental protection departments (e.g., Li Yuan, Deputy Director of the Ecological Department of the Ministry of Environmental Protection). The content of *emphasized* includes both central policies

(e.g., the construction of modern agriculture) and local innovations (e.g., the dominant position of farmers); *pointed out* adds perspectives from experts and grassroots practitioners (e.g., Xu Ke from the Ministry of Health); and *proposed* spans national strategic frameworks (e.g., the Central No.1 Document), policy tools (e.g., financial aid for rural students), and local implementation plans. This reflects a multi-perspective of central coordination plus local innovation, echoing the policy orientation of industry nurturing agriculture and urban-rural integration in new countryside construction.

Phase 3 shows integration of global and grassroots perspectives. The discourse subjects become more diversified, including central leaders (e.g., President Xi Jinping), grassroots cadres (e.g., Chen Yong, Party branch secretary of Dongding Village, Boshan District, Zibo City), foreign observers (e.g., David Gilly), and villagers (e.g., Liu Wei, a villager). The content of *said* includes both policy implementation (e.g., the industrial income increase) and international comparisons (e.g., China-Vietnam agricultural cooperation), while *proposed* focuses on national strategic documents (e.g., the Central

No. 1 Document). This forms an integrated perspective of national strategy plus grassroots' practice plus international vision,

reflecting rural revitalization as both a national strategy and global experience.

Table 7. Sample concordance lines related to perspectivization in each phase

Phase 1		
Original: 据水利部副部长翟浩辉今天在此间	说,	到今年年底
Translation: According to what Zhai Haohui, vice minister of the Ministry of Water Resources,	said	here today, by the end of this year
Original: 会议	提出,	当前和今后一个时期
Translation: The (central) meeting	proposed	that at present and in the period ahead
Original: 胡锦涛	强调,	这次学习教育活动的宝贵经验
Translation: Hu Jintao	emphasized	that the precious experience gained from this learning and education campaign
Phase 2		
Original: 邯郸市委书记崔江水	说,	市里打破城乡二元结构
Translation: Cui Jiangshui, Secretary of the CPC Handan Municipal Committee	said	that the city has broken down the urban-rural dual structure
Original: 一号文件明确	提出,	要完善县域村镇体系规划和村庄规划
Translation: The No. 1 Central Document explicitly	proposed	that it is necessary to improve the planning of county-level town and village systems and the planning of individual villages
Original: 回良玉	强调,	加强农业基础设施建设
Translation: Hui Liangyu	emphasized	that strengthening the construction of agricultural infrastructure
Phase 3		
Original: 淄博市博山区东顶村党支部书记陈勇	说。	
Translation: Chen Yong, Party branch secretary of Dongding Village, Boshan District, Zibo City,	said.	
Original: 2024年中央一号文件	提出,	实施农民增收促进行动
Translation: The 2024 Central No. 1 Document	proposed	that implementing farmers' income promotion action
Original: 习近平总书记多次	强调,	中国要强
Translation: General Secretary Xi Jinping has repeatedly	emphasized	that if China is to be strong

Sociopolitical context and ideological embeddedness: Mutual construction of policy transformation and discourse change

Consistent with the DHA's core principle of historical contextualization, the discursive evolution of rural China is inextricably linked to the broader sociopolitical context. The thematic and strategic shifts in *People's Daily* discourse are not incidental but are deeply embedded in and responsive to major policy transitions. Phase 1 corresponds to the rural tax and fee reform pilot in 2000. The discourse focuses on reducing burdens and grassroots stability, reflecting the governance logic of the state alleviating rural contradictions through policy adjustments. Phase 2 starts with the 2005 proposal of Building a New Socialist Countryside strategy. The discourse shifts to construction and balancing urban and rural areas, reflecting the policy orientation of industry nurturing agriculture in the mid-industrialization stage and the systematic investment in rural infrastructure and public services. Phase 3 begins with the 2017 proposal of the Rural Revitalization Strategy. In the discourse, *countryside* replaces *rural areas*, and *revitalization* replaces *construction*, echoing the goal of agricultural and rural modernization in the new era, as well as diverse development needs such as urban-rural integration, ecological civilization, and cultural inheritance. Meanwhile, the inclusion of international perspectives also reflects the global significance of China's rural development experience.

The representation of rural China in the three phases have different ideological embeddedness. Phase 1 responds to the need for alleviating rural burdens through tax reforms, constructing an image of the state as a problem-solver of rural grievances. Phase 2 aligns with the mid-industrialization strategy of industry nurturing agriculture, framing the state as an architect of balanced urban-rural development. Phase 3 echoes the new-era goal of agricultural and rural modernization under the Rural Revitalization Strategy,

portraying the state as a visionary leader of comprehensive national rejuvenation. In each phase, *People's Daily*, as the party's mouthpiece, translates policy into discourse that naturalizes the state's ideological priorities, making them appear as inevitable and beneficial to all.

In sum, the discursive construction of rural China is both a reflection of sociopolitical practice and a symbolic tool for policy promotion. The discourse change from rural governance to rural revitalization not only records the development process of China's rural areas but also reveals the power interaction and value reconstruction among the state, society, and market in the rural field.

Conclusion and discussion

This study employs a corpus-assisted discourse analysis combined with the Discourse-Historical Approach (DHA) to examine the diachronic representation of rural China in *People's Daily* from 2000 to 2025. The primary findings are as follows.

First, the thematic evolution of rural discourse in *People's Daily* aligns closely with phased shifts in national rural policies. This alignment empirically supports the DHA premise that discourse is a social practice shaped by and shaping its historical context. The progression from "Rural Basic Governance" to "New Socialist Countryside Construction" and finally to "Comprehensive Rural Revitalization" in the media narrative demonstrates how state-aligned media actively constructs thematic agendas that mirror and legitimize policy evolution.

Second, the analysis of discursive strategies reveals the linguistic mechanisms of this construction. The nomination strategy's shift from the administrative-economic term *rural areas* to the culturally-inflected *countryside* is a key finding. It provides empirical evidence for how language is used to symbolically reconstruct social reality, in this case, redefining the conceptualization of rural space to fit new policy goals (Visser, 2010). Similarly, the evolution in perspectivization, from a monolithic, government-led voice to a multi-stakeholder

chorus incorporating local, corporate, and international actors, illustrates how discourse manages and distributes symbolic power. This strategy enhances the legitimacy of policies by making them appear consensual and widely supported, reflecting a sophisticated application of agenda-setting (McCombs and Shaw, 1972) within a state-media framework.

Third, situating these linguistic patterns within the sociopolitical context, as mandated by DHA, clarifies their ideological function. The discourse in *People's Daily* is not a neutral reflection but an active, ideological construction. It consistently frames the state as the central, benevolent agent in rural transformation, first as a solver of peasant burdens, then as a designer of modern countryside, and finally as a visionary leader of revitalization. This study thus contributes to the theoretical understanding of discourse-power dynamics (Hall, 1997; Wodak, 2015) by showing how macro-level policy is operationalized through micro-level linguistic choices in a state-media context.

Empirically, this research addresses a gap in focusing on domestic Chinese-language mainstream media. It complements studies on international media (Pan, 2024) by highlighting the distinct, state-strategic construction of rural narratives for a domestic audience. The findings underscore the hegemonic nature of this discourse: while it shows an apparent diversification of voices (perspectivization), the overarching narrative remains tightly aligned with national policy, potentially marginalizing alternative or critical rural narratives (Luo, 2011).

Research limitations and future directions

Despite the insights gained from examining the diachronic representation of rural China in *People's Daily*, this study has several limitations that warrant acknowledgment, while also pointing to avenues for future research. First, it focuses solely on *People's Daily*, limiting insights into rural representations in other media such as local newspapers, social platforms, or non-mainstream outlets, which may offer

divergent narratives. Second, the corpus selection might exclude relevant texts where rural themes were implicitly embedded, narrowing thematic comprehensiveness. Third, the analysis prioritizes “nomination” and “perspectivization” within the Discourse-Historical Approach (DHA), leaving other critical strategies (e.g., predication, argumentation) under-explored, which could have enriched understanding of discourse legitimization. Future research could expand to comparative studies across diverse media, broaden the corpus scope, deepen the analysis of discursive strategies, and conduct international and cross-cultural comparisons to more comprehensively and dynamically interpret the media construction of rural China.

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Chen Limin, Lecturer of the School of Foreign Languages, specializes in corpus linguistics and discourse analysis, Guilin Tourism University, China.

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Vahid Shahidipour¹ **Move-Step Structures in English vs. Persian Research-Article Abstracts Across Three Disciplines (2022-2024)**

¹ Mofid University,
Mofid Sq., Qom, Iran
E-mail: shahidipour@mofidu.ac.ir
ORCID: 0000-0001-9862-0002

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Abstract: Researchers often have to develop abstracts in both English and their native language when intending to get their research articles (RAs) published in scholarly journals. Some, however, encounter challenges in this process, one of which is related to the rhetorical moves (RMs). This study endeavored to examine the RMs and steps of English and Persian RA abstracts recently published in top-tier journals across hard, medical, and soft disciplines. To this end, 150 English and 150 Persian abstracts from the disciplinary domains of Computers and Electrical Engineering (CEE), Psychiatry, and Applied Linguistics (AL), published in Scopus or Web of Science-indexed journals from 2022 to 2024, were selected, according to journal indexing, abstract policy, and availability. The corpus comprised primarily unstructured abstracts, with the exception of Psychiatry journals, which followed disciplinary conventions for structured formats. The abstracts were analyzed adopting Hyland's (2000) five-move framework. The findings suggested that the Product, Purpose, and Method moves were the most frequent in the abstracts (89.33%, 82.66%, and 81.66%, respectively). The most common RM pattern was the five-move organization of Introduction-Purpose-Method-Product-Conclusion (38.33%) in the RA abstracts. Inferential analyses revealed that the probability of observing the full pattern was over 0.70 in Psychiatry but only 0.20 in CEE, with Persian abstracts showing greater structural diversity. They also demonstrated that the Conclusion move was significantly more prevalent in Psychiatry abstracts than in CEE, and in English AL abstracts than in their Persian counterparts. Furthermore, the outcomes indicated that the abstracts typically contained an average of 5.86 steps, with the Purpose step being the most recurrent (16.76%), followed by the Product and Instrument steps (16.3% and 14.6%, respectively). Statistical modeling of steps identified significant language-discipline interactions, with the Definition and Conclusion steps showing the most pronounced variation. Additionally, it was found that the step pattern of the Prominence-Gap-Purpose-Participant-Instrument-Product-Implication was the most frequently used in abstract development. This study's findings may give valuable insights into the patterns of English and Persian abstracts in various fields of study, which can be beneficial for English for Academic Purposes and academic writing courses.

Keywords: Hyland move model; Step patterns; Dual moves; Cross-linguistic abstract structure; Disciplinary variation

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Introduction

Research articles (RAs) constitute the primary medium through which scientific knowledge is disseminated and disciplinary interaction is sustained within academic communities (Tankó, 2017). Researchers from various disciplines in different languages have been striving to carry out and publish research for knowledge development. Central to this communicative process is the abstract, which functions as a structured summary of the study and enables readers and journal editors to make preliminary evaluative decisions regarding relevance and contribution (Bhatia, 1993; Lorés, 2004). As Doró (2013) notes, abstracts render research accessible to a broader readership, while simultaneously performing a “gatekeeping function” by encouraging or discouraging further engagement with the full text (Porush, 1995: 76).

Despite the centrality of abstracts in academic publishing, constructing this section appropriately poses challenges for many researchers, whether writing in a first or second language (Johns, 1992; Ventola, 1994). These challenges stem from factors such as poor general and academic writing skills in the first or second language, limited genre awareness, unfamiliarity with disciplinary conventions, and difficulty recognizing rhetorical variation across fields. Among the structural features of RA abstracts, rhetorical moves (RMs) play a central role in shaping organization and communicative function. Deviations from conventional move patterns may result in abstracts that diverge from disciplinary expectations, potentially affecting textual coherence and evaluative reception. Consequently, the organization of abstracts in terms of RMs has become a central concern in genre-analytic research, motivating extensive empirical investigations across languages, disciplines, and academic

contexts (e.g., Amnuai, 2019; Khany and Malmir, 2020; Marefat et al., 2021; Zand-Moghadam and Zhaleh, 2022, to name just a few).

Existing cross-linguistic studies of RA abstracts have typically focused on a single discipline using limited corpora and relied primarily on move-level analysis, limiting their ability to capture fine-grained rhetorical variation across epistemic contexts. Conversely, step-level investigations have tended to examine either one language or one disciplinary domain, leaving the interaction between language and discipline underexplored. To date, no study has systematically examined step-level rhetorical variation across multiple disciplines and languages within a balanced design using recent, comparable journal corpora and employing inferential tests. The present study addressed this gap by adopting a balanced cross-linguistic (English-Persian) and cross-disciplinary (Computers and Electrical Engineering – CEE, Psychiatry, and Applied Linguistics – AL) design, integrating move- and step-level analysis, and applying explicit inferential testing to a controlled corpus of abstracts published between 2022 and 2024. On this basis, and in order to operationalize these analytical objectives, the study formulated the following research questions:

Research Question One: What are the frequent RMs in the English and Persian RA abstracts from Scopus or Web of Science-indexed journals across the various areas of CEE, Psychiatry, and AL published from 2022 to 2024?

Research Question Two: What are the frequent steps of RMs used in the RA abstracts in English and Persian from Scopus or Web of Science-indexed journals across the distinct fields of CEE, Psychiatry, and AL published from 2022 to 2024?

Research Question Three: What are the common RM patterns among the three diverse domains of CEE, Psychiatry, and AL RA abstracts in English and Persian journals indexed in Scopus or Web of Science, published between 2022 and 2024?

The hypotheses of the present study are grounded in genre-based views of academic discourse, which conceptualize RA abstracts as sites where disciplinary epistemologies and rhetorical conventions intersect (Hyland, 2000; Swales, 2004). Disciplines differ in how knowledge is produced, validated, and communicated, and these differences are reflected in the rhetorical structuring of abstracts. Fields such as Psychiatry, which rely on empirical validation involving human participants and standardized reporting norms, are therefore expected to exhibit higher degrees of move conventionalization and more explicit realization of Method- and Conclusion-related steps. By contrast, engineering-oriented disciplines such as CEE, which prioritize problem-solution logics and technological contribution, may place comparatively less rhetorical emphasis on evaluative or inferential concluding functions. AL, positioned between hard and soft sciences, is expected to display greater rhetorical flexibility, particularly at the step and move-pattern levels.

In addition to disciplinary influences, cross-linguistic variation is expected to shape abstract organization. English and Persian academic writing operate within partially distinct institutional, rhetorical, and educational contexts, which may affect how research significance, methodological detail, and contribution are rhetorically compressed or elaborated in abstracts. These differences are treated not as deficiencies, but as conventionalized preferences in abstract construction. Accordingly, the hypotheses predict systematic Language $\times$ Discipline effects in move presence, step realization, and move-pattern selection, rather than uniform variation attributable to language or discipline alone. Particularly, the following hypotheses were proposed.

Hypothesis One: The Conclusion move appears significantly more frequently in Psychiatry abstracts than in CEE and AL abstracts, reflecting the discipline's emphasis on outcome evaluation and clinical relevance, and is more prevalent in English than in Persian abstracts.

Hypothesis Two: Step realizations within the Method move differ systematically by discipline, with Instrument steps occurring more frequently in CEE abstracts and Participant steps occurring more frequently in Psychiatry and AL abstracts.

Hypothesis Three: Persian abstracts contain a higher proportion of Definition steps and a lower proportion of Gap steps than English abstracts, reflecting language-specific rhetorical preferences in establishing research significance.

Literature Review

Move Analysis in RA Abstracts

RA abstracts have long been recognized as a highly conventionalized academic genre, characterized by recurring rhetorical functions that enable writers to present complex studies concisely and persuasively (Doró, 2013; Lorés, 2004). Genre-analytic research has consistently shown that abstracts tend to follow a limited set of macro-structural patterns, typically realized through a sequence of RMs such as contextualizing the research, stating its purpose, outlining methodological procedures, reporting findings, and drawing conclusions (Pho, 2008; Santos, 1996). Across disciplines, these core functions appear relatively stable, suggesting that abstracts serve a shared communicative purpose within academic publishing.

At the same time, the relative prominence and optionality of individual moves are not uniform across research contexts. While studies in AL and related fields have consistently reported high frequencies of Purpose, Method, and Product moves, the Introduction and Conclusion moves are often optional or variably realized (Santos, 1996; Tseng, 2011). In contrast, research in scientific and medical domains tends to exhibit more complete move

realizations, particularly where methodological transparency and outcome evaluation are central to disciplinary standards of knowledge validation (Ramadhini et al., 2021; Samraj, 2005). These findings suggest that, despite a shared communicative core, abstract structure is shaped by contextual factors that extend beyond genre conventions.

Cross-Disciplinary Variation

Building on this observation, disciplinary variation has emerged as a key explanatory factor in abstract organization. Comparative genre studies have shown that even closely related fields may differ systematically in how they prioritize rhetorical functions and sequence moves (Samraj, 2005; Suntara and Usaha, 2013). Disciplines grounded in experimental and empirical traditions typically foreground methodological detail and result reporting, whereas fields with interpretive or applied orientations allocate greater rhetorical space to contextualization or implications (Nagano, 2015). From this perspective, disciplinary affiliation does not merely modulate move frequency but reflects deeper epistemological orientations that shape how research is framed, justified, and evaluated in abstract form.

Such differences are not simply stylistic but reflect how disciplines construct and legitimate knowledge. In engineering-related fields, for instance, abstracts often emphasize problem specification, instrumental design, and product outcomes, aligning with a problem-solution epistemology. In contrast, medical and clinical disciplines frequently foreground participant characteristics, procedures, and evaluative conclusions, reflecting their reliance on human-subject research and evidence-based practice. AL, as a hybrid field, often exhibits rhetorical flexibility, combining empirical reporting with contextual and pedagogical framing (Pho, 2008). These disciplinary tendencies highlight the importance of analyzing abstract rhetoric in relation to domain-specific communicative priorities. Supporting this

view, Tseng (2011), in a cross-disciplinary analysis of abstracts from applied sciences and humanities, found that experimental disciplines exhibited significantly higher frequencies of Method and Result moves, whereas soft disciplines showed greater variability in Introduction and Conclusion moves. Similarly, Doró (2013) reported that disciplinary membership accounted for substantial variation in move sequencing and optionality in abstracts, suggesting that abstract organization is closely aligned with discipline-specific norms of knowledge presentation.

Cross-Linguistic Variation

In addition to disciplinary influences, language-specific rhetorical conventions play a significant role in shaping abstract structure. Cross-linguistic studies comparing English with other languages have shown that writers may differ in how explicitly they articulate research gaps, define key concepts, or evaluate findings, even when targeting international journals (Johns, 1992; Karimah et al., 2023; Li, 2020). For example, abstracts written in languages other than English have been found to rely more heavily on definitional framing or implicit contextualization, while English abstracts often prioritize explicit gap articulation and outcome evaluation.

Comparative research on English and Persian academic writing consistently reports systematic differences in rhetorical preferences, particularly in the realization of introductory and concluding functions. Across disciplines, Persian abstracts have been shown to rely more heavily on definitional framing and general macro-moves, while English abstracts tend to foreground explicit problematization, methodological specification, and result reporting (Ghasempour and Farnia, 2017; Marefat et al., 2021; Marefat and Mohammadzadeh, 2013; Zand-Vakili and Fard Kashani, 2012). Importantly, these studies converge in showing that such differences persist even in abstracts published in indexed journals, suggesting that language-specific rhetorical

conventions are not fully neutralized by globalized publishing norms.

Step-Level Analyses

While move-level analyses have provided valuable insights into abstract macro-structure, they often obscure finer-grained rhetorical distinctions within moves. Step-level analysis addresses this limitation by identifying more specific communicative functions, such as defining concepts, specifying participants, describing instruments, or articulating implications. Studies employing step-level frameworks have shown that steps within the same move can vary substantially in frequency and function across disciplines (Khany and Malmir, 2020; Li, 2020). In a qualitative, cross-disciplinary study, Relawati and Basthomi (2021) investigated the moves and steps of 48 abstracts published in a journal. The findings revealed that most abstracts used Move 3 (Method, 46 abstracts), Move 4 (Product, 44 abstracts), and Move 2 (Purpose, 40 abstracts). In their corpus, authors most frequently applied Step 1 within Move 2 (Purpose), Step 1 within Move 4 (Product),

and Step 3 within Move 3 (Procedure). These patterns suggest that step-level realizations provide critical insight into how rhetorical functions are operationalized within moves, thereby motivating the present study's focus on step-level variation across both disciplinary and linguistic contexts.

However, step-level research remains comparatively limited in scope. Most studies focus on a single language or a single disciplinary domain, which restricts their ability to account for interaction effects between language and discipline. Consequently, it is still unclear whether observed step distributions are driven primarily by disciplinary epistemologies, linguistic conventions, or their combined influence. Moreover, few studies have integrated step-level analysis with probabilistic or inferential methods capable of testing such interactions explicitly.

Summary and Research Gap

To synthesize the existing literature and clearly position the current study, Table 1 provides a summary of key previous research, highlighting the corpora, foci, findings, and limitations.

Table 1. Summary of Selected Previous Studies on Move and Step-Level Analysis in Abstracts

Study	Language(s)	Discipline(s)	Corpus Size	Analytical Level	Key Findings	Limitations Identified
Santos (1996)	English	AL	94	Move-level	Purpose, Method, and Product moves were most frequent; Introduction and Conclusion were optional	Single discipline; no cross-linguistic comparison; no step-level analysis
Samraj (2005)	English	Wildlife Behavior, Conservation Biology	48	Move-level	Experimental disciplines showed a stronger tendency toward fuller move realizations, particularly for Results	Limited corpus size; no cross-linguistic comparison; no step-level analysis
Pho (2008)	English	AL vs. Educational Technology	30	Move-level	AL showed more rhetorical flexibility; Educational Technology prioritized Method and Product	Limited corpus size; no cross-linguistic dimension; no step-level analysis
Tseng (2011)	English	AL	90	Move-level	Experimental studies used more Method and Result moves; non-experimental studies showed greater variation	Move-level focus only; no cross-linguistic comparison

Zand-Vakili and Fard Kashani (2012)	English vs. Persian	Linguistics	10	Move-level		Persian abstracts used broader macro-moves with fewer detailed sub-moves	Very small corpus; single discipline; no step-level analysis
Doró (2013)	English	Linguistics vs. Literature	40	Move-level		Move sequencing and optionality varied significantly by discipline	No step-level analysis; no cross-linguistic comparison
Marefat and Mohammadzadeh (2013)	English vs. Persian	Literature	90	Move-level		Native Persian writers had minor deviations in comparison to Native English writers.	Single discipline; no step-level analysis
Suntara and Usaha (2013)	English	Linguistics, AL	200	Move-level		AL used 4 moves (Introduction, Purpose, Method, Product); Linguistics used 3 (Purpose, Method, Product).	Move-level focus only; no cross-linguistic comparison
Ghasempour and Farnia (2017)	English vs. Persian	Law	90	Move-level		All five moves were obligatory in English; only Introduction and Purpose were obligatory in Persian	Single discipline; move-level focus only
Li (2020)	English vs. Chinese	AL	108	Move Step	+	Step realizations varied by language even within identical moves	No disciplinary comparison
Relawati and Basthomi (2021)	English	Cross-disciplinary	48	Move Step	+	Move 3 (Method) and Move 4 (Product) were dominant; Purpose, Product, and Procedure steps were also most frequent	No language comparison; small corpus; no inferential testing
Arsyad et al. (2023)	English	Language-related fields	100	Move-level		Four moves (Moves 2 to 5) were frequently used.	No cross-linguistic or disciplinary contrast; move-level focus only
Present study	English vs. Persian	CEE, Psychiatry, AL	300	Move Step	+	Examined cross-linguistic and cross-disciplinary variation in moves and steps, identifying frequent patterns and statistically significant differences	

In sum, existing research has established that RA abstracts exhibit both cross-disciplinary and cross-linguistic variation in rhetorical organization. Move-level analyses have identified relatively stable macro-structures, while step-level studies have revealed finer-grained functional variation. However, as shown in Table 1, previous research has either examined move-level variation across disciplines or languages

or step-level realizations within a single language or discipline, leaving the interaction between language and discipline at the step level largely unexplored. In other words, cross-linguistic studies rarely operate at the step level, and step-level studies seldom adopt a balanced cross-disciplinary design.

To address this gap, the present study adopted a genre-analytic framework capable of capturing both stable macro-structural

patterns and finer-grained rhetorical variation. Specifically, it employed a move-step model that allows systematic comparison across languages and disciplines while remaining sensitive to the epistemological assumptions embedded in abstract writing. The following section outlines the theoretical framework underpinning the analysis and explains how the selected model operationalizes RMs and steps for cross-linguistic and cross-disciplinary comparison.

Theoretical Framework

Move analysis provides a functional approach to genre investigation by examining how texts are organized into recurrent rhetorical units that fulfill specific communicative purposes (Swales, 2004, 2019). Since its initial application to RA introductions (Swales, 1981), move analysis has been extended to a range of academic genres, including abstracts, leading to the development of several influential analytic models (Bhatia, 1993; Santos, 1996). These models converge in treating abstracts as functionally structured summaries, but differ in their treatment of purpose statements, methodological detail, and evaluative conclusions, differences that have direct implications for cross-disciplinary and cross-linguistic comparison.

Hyland's Move-Step Model as an Analytic Lens

This study adopted Hyland's (2000) five-move model, Introduction, Purpose, Method, Product, and Conclusion, as its primary analytic framework. Unlike earlier models (e.g., Swales' CARS model), Hyland's framework was specifically designed to capture the functional organization of abstracts across disciplines. Its emphasis on communicative purpose rather than surface linguistic form makes it particularly suitable for comparative genre analysis.

In this framework, each move represents a distinct rhetorical function, which may be realized through one or more steps. Steps are treated as sub-move units that operationalize how a move's communicative goal is achieved in discourse. For example,

the Method move may be realized through steps specifying participants, instruments, procedures, or data sources. This step-level granularity enables a more precise examination of how rhetorical functions are distributed within abstracts and how they vary across languages and disciplines.

Interpreting Disciplinary Epistemology through Step Bundles

Rather than treating moves and steps as purely formal features, this study interpreted recurrent step combinations as indicators of underlying disciplinary epistemologies. For instance, frequent clustering of Participant and Evaluation steps may signal a discipline's emphasis on empirical validation and human-subject relevance, whereas repeated Instrument–Product pairings may reflect a problem–solution orientation typical of engineering research. At the same time, the framework acknowledges its limitations: move-step analysis cannot capture all dimensions of rhetorical meaning, such as stance, evaluative intensity, or interpersonal positioning, which fall outside the scope of the present study.

By employing Hyland's model as an analytic lens rather than a prescriptive template, the study aimed to balance methodological rigor with theoretical sensitivity, allowing for systematic comparison while recognizing the contextual constraints of abstract writing.

Methodology Research Design

This study employed a corpus-based, cross-linguistic, and cross-disciplinary genre-analytic design to examine rhetorical move-step realizations in RA abstracts. The design integrated qualitative rhetorical coding with quantitative inferential statistics to investigate systematic variation in abstract structure as a function of language (English vs. Persian), discipline (CEE, Psychiatry, AL), and their interaction. This mixed analytic approach allows both fine-grained functional interpretation and statistically grounded comparison across groups.

Corpus Compilation

The corpus comprised 300 RA abstracts, including 150 English and 150 Persian texts. For each language, 50 abstracts were sampled from each of the three disciplinary domains (CEE, Psychiatry, AL), yielding a fully balanced design (Language × Discipline). This balance ensured that no single language or field disproportionately influenced the observed rhetorical patterns.

The selection of disciplines was theoretically motivated. Following Hyland’s (2000) characterization of disciplinary knowledge as existing along a continuum rather than a rigid hard-soft dichotomy, the three domains were chosen to represent distinct epistemological orientations: CEE (engineering-oriented, problem-solution driven), Psychiatry (medical, empirically evaluative), and AL (social science-oriented and interpretive). This configuration enabled systematic investigation of disciplinary effects while avoiding oversimplified binary classifications.

All abstracts were drawn from peer-reviewed journals indexed in Scopus or Web of Science and published between 2022 and 2024, ensuring temporal consistency and alignment with current abstract-writing conventions.

Journal Selection and Quality Control

To ensure cross-linguistic and cross-disciplinary comparability, journals were selected based on explicit and verifiable criteria rather than evaluative labels such as “high-quality” or “high-credit.” Specifically, inclusion required:

1. **Indexing tier:** Journals had to be indexed in Scopus or Web of Science at the

time of data collection. Persian-language journals were additionally required to be indexed in ISC and Scopus to ensure international visibility.

2. **Disciplinary scope:** Clear alignment with one of the three target disciplines, as indicated in the journal’s stated aims and scope.

3. **Abstract policy:** Mandatory inclusion of an abstract for all empirical RAs.

4. **Author guidelines:** Availability of explicit abstract-writing guidelines, including scope and length expectations.

5. **Publication window:** Articles published between January 1, 2022, and December 31, 2024, to minimize diachronic variation.

6. **Language:** Abstracts written exclusively in English or Persian.

These criteria were applied uniformly across languages to minimize systemic bias arising from journal prestige, editorial practices, or abstract conventions.

Corpus Selection Procedure

Abstract selection followed a PRISMA-style screening process to enhance transparency and replicability. During the identification stage, 366 abstracts were retrieved from six journals. During screening, 66 records were excluded because they were non-empirical articles, conference abstracts, review papers, or fell outside the specified publication window or word-length range. The final corpus consisted of 300 abstracts (150 English, 150 Persian), evenly distributed across the three disciplines. Detailed corpus characteristics, including journal titles, indexing status, and article counts, are reported in Table 2.

Table 2. Corpora Details

Discipline	Journal Title	Language	Indexing Status/ Impact Factor	Number of Articles
CEE	Computers and Electrical Engineering	English	Elsevier, Scopus/4	50

	<i>Journal of Iranian Association of Electrical and Electronics Engineers</i>	Persian	ISC, Scopus	50
Psychiatry	<i>The Canadian Journal of Psychiatry</i>	English	Sage, Scopus/4.6	50
	<i>Iranian Journal of Psychiatry and Clinical Psychology</i>	Persian	ISC, Scopus	50
AL	<i>System</i>	English	Elsevier, Scopus/4.9	50
	<i>The Language Related Research</i>	Persian	ISC, Scopus	50
Total				300

Abstract Format Considerations

The corpus consisted predominantly of unstructured abstracts. However, in the Psychiatry sub-corpus, structured abstracts (e.g., Objective, Methods, Results, Conclusion) were common. To avoid systematic bias, section headings were not treated as coding units. Instead, RMs and steps were identified solely on the basis of semantic content, regardless of typographic structure.

Thus, a sentence appearing under a heading such as *Conclusion* was not automatically coded as a Conclusion move unless it fulfilled the functional criteria defined in the analytical framework. This procedure ensured functional equivalence across structured and unstructured abstracts. The potential facilitative effect of structured formats on the explicit realization of certain moves, particularly evaluative Conclusion steps, is addressed in the Discussion and Limitations sections.

Analytical Framework

Rhetorical analysis in the present study was conducted using Hyland's (2000) five-move model, comprising Introduction, Purpose, Method, Product, and Conclusion. This framework was selected because it was explicitly developed for RA abstracts and is designed to capture their functional organization across disciplinary contexts. Compared with earlier models, Hyland's framework offers greater analytical coverage and flexibility: Swales' (1990) CARS model does not explicitly accommodate a distinct Purpose move, Bhatia's (1993) model does

not account for niche-establishing or gap-related functions, and Santos's (1996) model was derived from a relatively small, single-discipline corpus. By contrast, Hyland's model was constructed on the basis of a large, multi-disciplinary dataset (800 abstracts across eight fields), making it suitable for cross-disciplinary and cross-linguistic comparison. As noted by Suntara and Usaha (2013), this model has demonstrated strong explanatory power in capturing abstract rhetorical structure.

Within this framework, each move represents a distinct communicative function and may be realized through one or more steps. In the present study, moves and steps were operationalized following Hyland's original definitions. Detailed step descriptions, coding criteria, and borderline examples (e.g., Definition vs. Generalization; Introduction vs. Purpose) are provided in Appendix A to ensure transparency and replicability.

Unit of Analysis and Treatment of Dual Moves

In the present study, the unit of analysis was the clause or clause complex conveying a single dominant rhetorical function. Sentence boundaries were not treated as decisive, as a single sentence may realize multiple rhetorical functions, while a single function may extend across multiple clauses. This clause-based approach is consistent with prior genre-analytic research and allows more precise identification of rhetorical functions in compressed abstract discourse.

In cases where a single textual segment simultaneously fulfilled two distinct rhetorical functions, dual moves (DMs) were assigned (e.g., stating the objective while providing information about designs). To ensure analytical consistency and prevent inflation of move counts, DMs were treated according to the following protocol:

1. **For move presence/absence analysis:** An abstract containing a DM was considered to possess each of its constituent moves. For instance, an abstract with a Purpose + Method DM was counted as having both Purpose and Method moves present. This approach prioritizes rhetorical function over syntactic packaging.

2. **For total move instance counts:** In calculating total move occurrences, each DM was counted as one move instance to avoid double-counting. This conservative approach ensures that overall move density calculations are not artificially inflated.

3. **For inferential statistical tests:** DMs were included as follows: In Fisher's exact tests for move presence, constituent moves within DMs contributed to the presence counts as described in point 1. Moreover, DMs themselves were analyzed as a separate categorical variable to examine rhetorical compression patterns.

Coding Procedure

Coding followed a multi-stage, replicable workflow:

1. **Training and calibration:** The primary coder studied Hyland's move-step taxonomy and conducted pilot coding on a subset of abstracts to establish decision rules.

2. **Primary coding:** All abstracts were manually coded for moves and steps at the clause level. For analytical consistency, each move and step was assigned a standardized alphanumeric code during annotation. Moves were labeled using initial letters (e.g., Introduction = I, Purpose = P, Method = M, Product = PR, Conclusion = C), and steps were coded using move-specific extensions. Clauses realizing two rhetorical functions simultaneously were coded as DM. The complete coding scheme, including all move-

and step-level symbols and illustrative examples, is provided in Appendix A.

3. **Reliability check:** Two coders independently coded 30% of the corpus.

4. **Verification and adjudication:** Ambiguous cases were revisited, discussed with expert coders, and resolved through consensus.

5. **Final coding lock:** The dataset was finalized prior to inferential analyses.

Reliability

To establish inter-coder reliability, two expert coders independently reviewed 30% of the corpus (15% English and 15% Persian abstracts within each discipline). Agreement was calculated using Cohen's Kappa (κ). The results indicated substantial agreement for both moves ($\kappa = .81$, 95% CI [.76, .86]) and steps ($\kappa = .76$, 95% CI [.70, .82]). Discrepancies were resolved through discussion prior to final analysis.

Data Analysis

Following coding, frequencies and percentages of moves and steps were calculated. Inferential analyses were conducted to evaluate cross-linguistic and cross-disciplinary differences as follows.

1. **Research Question One:** Presence-absence contrasts for key moves (Introduction, Method, Conclusion) were tested using Fisher's exact tests, with odds ratios (ORs) and 95% confidence intervals (CIs).

2. **Research Question 2:** Step-level variation was examined using chi-square tests of independence conducted on contingency tables crossing step realization with Language and Discipline. Cramér's V was reported to indicate effect size.

3. **Research Question 3:** Abstract move-pattern preferences were analyzed by calculating predicted probabilities from observed pattern frequencies within each Language $\times$ Discipline group, with 95% CIs estimated using standard approximation methods.

Together, these analyses enabled systematic testing of rhetorical variation

across languages, disciplines, and analytic levels.

Results

Move Presence and Absence Across Disciplines and Languages

The study's first research question sought to probe into the RMs used in the English and Persian abstracts of the RAs in

the three diverse areas of CEE, Psychiatry, and AL published in peer-reviewed journals indexed in Scopus or Web of Science between 2022 and 2024. Utilizing Hyland's (2000) five-move framework, the frequency and distribution of RMs were first examined across disciplines and languages (Table 3).

Table 3. Abstract RMs Across Disciplines and Languages

Discipline	Language		I	P	M	PR	C	DM	Total Abstracts
CEE	English	f	39	41	44	46	14	9	50
		%	78	82	88	92	28	18	100
	Persian	f	22	47	41	39	5	8	50
		%	44	94	82	78	10	16	100
	Total	f	61	88	85	85	24	17	100
		%	61	88	85	85	24	17	100
Psychiatry	English	f	37	47	49	49	50	2	50
		%	74	94	98	98	100	4	100
	Persian	f	26	45	48	48	48	3	50
		%	52	90	96	96	96	6	100
	Total	f	63	92	97	97	98	5	100
		%	63	92	97	97	98	5	100
AL	English	f	35	38	38	43	44	18	50
		%	70	76	76	86	88	36	100
	Persian	f	32	30	25	43	10	22	50
		%	64	60	50	86	20	44	100
	Total	f	67	68	63	86	54	40	100
		%	67	68	63	86	54	40	100
Total	English	f	111	126	131	138	108	29	150
		%	74	84	87.33	92	72	19.3	100
	Persian	f	80	122	114	130	63	33	150
		%	53.33	81.33	76	86.66	42	22	100
	Total	f	191	248	245	268	171	62	300
		%	63.66	82.66	81.66	89.33	57	20.6	100

As Table 3 displays, all of the RMs presented in Hyland's (2000) framework were found across the six corpora. It also indicates that the Product, Purpose, and Method moves were the most frequent ones (i.e., 89.33%, 82.66%, and 81.66%, respectively) in the English and Persian abstracts of the three areas of CEE, Psychiatry, and AL. Only 57%

of the papers contained the move of Conclusion in their abstracts. That was the least recurrent RM in the whole corpus. The Introduction move was present in 63.66% of the corpus, indicating that the Introduction move was not consistently realized across abstracts.

Disciplinary Contrasts in Move Presence

From a cross-disciplinary perspective, a marked difference among the three disciplines was observed in using the Conclusion move, which appeared differently in the RA abstracts from quantitative and qualitative aspects. This move was compulsory and more common in the Psychiatry abstracts, compared to those of CEE and AL. While almost all Psychiatry abstracts (98%) ended with the fifth move (Conclusion), only 24% of the CEE abstracts contained this move, although the CEE

journals have similar word limit policies and explicitly require authors to state the purpose of their research, principal results, and major conclusions (see their Author Guidelines sections). Psychiatry abstracts showed near-categorical realization of the Conclusion move, coinciding with the widespread use of structured abstract formats in this discipline. Abstracts of AL were somewhere between these two, manifesting 54% of the occurrence of Move 5. To statistically test these contrasts, Fisher's exact tests were conducted, yielding the following outcomes shown in Table 4.

Table 4. Move 5 (Conclusion) Contrasts

Contrast	Cases1 / N1	Cases2 / N2	Fisher <i>p</i>	OR	95% CI
AL (English vs. Persian)	44/50	10/50	4.59×10^{-12}	29.33	[9.77, 88.03]
Psychiatry vs. CEE (both languages)	98/100	24/100	1.13×10^{-30}	155.17	[35.56, 677.09]

Table 4 indicates that in AL, the Conclusion move appeared in 44/50 English abstracts (88%) but only 10/50 Persian abstracts (20%). A Fisher's exact test confirmed a highly significant language effect in AL ($p = 4.59 \times 10^{-12}$). The odds of an AL abstract in English containing a Conclusion move were about 29 times the odds for an AL abstract in Persian (OR = 29.33, 95% CI [9.77, 88.03]). Comparing disciplines (combined languages) revealed that Psychiatry abstracts almost always included a Conclusion move (98/100) while CEE abstracts rarely did so (24/100); this difference was extreme ($p < .0001$; OR $\approx$ 155.17, 95% CI [35.56, 677.09]). These

contrasts quantify and confirm the patterns described above, supporting the first hypothesis: Psychiatry, within this corpus, favors Conclusion moves, whereas CEE and Persian abstracts are far less likely to include them.

Another set of contrasts pertained to the Method move, existing in almost all the Psychiatry abstracts (97%). However, several abstracts in the other two disciplines were observed without using this move. To assess such disciplinary variation in the use of this move, the researcher compared its presence across CEE (85/100), Psychiatry (97/100), and AL (63/100) abstracts. Table 5 displays the results.

Table 5. Move 3 (Method) Contrasts Across Disciplines

Contrast	Cases1 / N1	Cases2 / N2	Fisher <i>p</i>	OR	95% CI
Psychiatry vs. CEE	97/100	85/100	0.0048	3.52	[1.44, 9.17]

Psychiatry vs. AL	97/100	63/100	< .0001	15.35	[5.28, 50.11]
CEE vs. AL	85/100	63/100	< .0001	4.43	[2.32, 8.70]

As shown in Table 5, pairwise Fisher tests confirmed that Psychiatry employed Move 3 significantly more than both CEE ($p = 0.0048$; OR = 3.52, 95% CI [1.44, 9.17]) and AL ($p < 0.0001$; OR = 15.35, 95% CI [5.28, 50.11]). CEE also exceeded AL in Method-move use ($p < 0.0001$; OR = 4.43, 95% CI [2.32, 8.70]). These contrasts reinforce the pattern that Psychiatry abstracts most consistently elaborate methodological details, AL abstracts least often do so, and CEE abstracts occupy an intermediate position.

A further cross-disciplinary contrast was attributed to the use of DMs. While it was common to include more than one move in a single segment in the AL abstracts (40%), rarely did the CEE and Psychiatry abstracts embed moves in one segment (17% and 5%, respectively). The most frequent embedded moves (i.e., 20) occurred between the moves of Introduction and Purpose or Purpose and Method in AL. To statistically test these contrasts, Fisher's exact tests were conducted, suggesting the following results (Table 6).

Table 6. DM Contrasts Across Disciplines

Contrast	Cases1 / N1	Cases2 / N2	Fisher p	OR	95% CI
AL vs. CEE	40/100	17/100	0.0005	3.25	[1.69, 6.28]
AL vs. Psychiatry	40/100	5/100	< .000001	12.67	[4.73, 33.89]
CEE vs. Psychiatry	17/100	5/100	0.019	3 .87	[1.39, 10.76]

As shown in Table 6, DM usage differed significantly across disciplines. Fisher's exact tests revealed that AL abstracts were significantly more likely to contain embedded rhetorical functions than those in CEE (OR = 3.25, 95% CI [1.69, 6.28], $p = .0005$). An even stronger contrast was observed between AL and Psychiatry, where AL abstracts were over twelve times more likely to employ DMs (OR = 12.67, 95% CI [4.73, 33.89], $p < .000001$). In contrast, DM usage was relatively rare in Psychiatry abstracts (5%), indicating a strong preference for functionally discrete clause-level realizations. These results provide inferential confirmation that rhetorical compression through DMs is discipline-sensitive rather than incidental.

Cross-Linguistic Contrasts in Move Presence

From a cross-linguistic perspective, the English abstracts were longer than their Persian counterparts, containing more moves in general (i.e., English abstracts: 585 moves; Persian abstracts: 476 moves). More particularly, the English abstracts comprised the Conclusion section more than the Persian ones. The most considerable difference between these two languages was found in the English and Persian AL abstracts concerning this section. While most of the English AL abstracts (88%) contained this mandatory move, just 20% of the Persian AL abstracts presented the Conclusion move. Additionally, only three English CEE abstracts lacked the Product move, while 11 Persian abstracts in

this major did not employ this move. Another distinction between the abstracts in the two languages was discovered regarding the occurrence of the Introduction move. In comparison to Persian, the English abstracts used the Introduction move, mainly focusing

on prominence and gap, more frequently. To evaluate cross-linguistic differences in the use of Move 1 (Introduction), the researcher compared its presence across all abstracts in English (111/150) and Persian (80/150) (see Table 7).

Table 7. Move 1 (Introduction) Contrasts Between English and Persian

Contrast	Cases1 / N1	Cases2 / N2	Fisher <i>p</i>	OR	95% CI
English vs. Persian	111/150	80/150	0.00012	2.38	[1.48, 3.82]

Based on Table 7, a Fisher's exact test revealed a statistically significant difference ($p = 0.00012$). The odds that an English abstract included the Introduction move were approximately twice those for a Persian abstract (OR = 2.38, 95% CI [1.48, 3.82]). This result confirms that English abstracts more consistently foreground backgrounding and contextualization than their Persian counterparts, which included Move 1 less often across all three disciplines.

Step-Level Distributions Across Disciplines and Languages

The next research question of the study focused on the frequent steps of RMs of the English and Persian RA abstracts from high-quality journals of the three distinct domains of CEE, Psychiatry, and AL from 2022 to 2024. Adopting Hyland's (2000) framework for the RM organization of abstracts, the researcher estimated each step's frequency and percentage in the abstracts of the three fields in the two languages. (Table 8).

Table 8. Step-Level Realizations Within RMs Across Disciplines and Languages

D ¹	L ³	IP	IG	ID	IGA	P	MP	MI	MP R	PR	CC	CE	CI	T ⁷	
CE E	E ⁴	f	33	6	7	33	50	1	45	33	47	4	3	9	271
		%	12.1 7	2.21	2.5 8	12.1 7	18.4 5	0.36	16.6	12.1 7	17.3 4	1.4 7	1.1	3.3 2	100
	P ⁵	f	23	0	6	16	49	1	42	27	44	1	1	4	214
		%	10.7 4	0	2.8	7.47	22.8 9	0.46	19.6 2	12.6 1	20.5 6	0.4 6	0.4 6	1.8 6	100
	T ⁶	f	56	6	13	49	99	2	87	60	91	5	4	13	485
		%	11.5 4	1.23	2.6 8	10.1	20.4 1	0.41	17.9 3	12.3 7	18.7 6	1.0 3	0.8 2	2.6 8	100
P ²	E	f	25	0	9	25	48	49	49	32	50	33	16	31	367
		%	6.81	0	2.4 5	6.81	13.0 7	13.3 5	13.3 5	8.71	13.6 2	8.9 9	4.3 5	8.4 4	100
	P	f	27	3	6	6	48	48	47	25	48	31	6	30	325
		%	8.3	0.92	1.8 4	1.84	14.7 6	14.7 6	14.4 6	7.69	14.7 6	9.5 3	1.8 4	9.2 3	100
	T	f	52	3	15	31	96	97	96	57	98	64	22	61	692
		%	7.51	0.43	2.1 6	4.47	13.8 7	14.0 1	13.8 7	8.23	14.1 6	9.2 4	3.1 7	8.9 5	100
AL	E	f	27	8	2	30	50	39	39	19	49	10	4	40	317
		%	8.51	2.52	0.6 3	9.46	15.7 7	12.3	12.3	5.99	15.4 5	3.1 5	1.2 6	12. 61	100

P	f	30	0	24	9	50	41	35	17	49	0	0	11	266
	%	11.2	0	9.0	3.83	18.7	15.4	13.1	6.39	18.4	0	0	4.1	100
T	f	57	8	26	39	100	80	74	36	98	10	4	51	583
	%	9.77	1.37	4.4	6.68	17.1	13.7	12.6	6.17	16.8	1.7	0.6	8.7	100
Total	f	85	14	18	88	148	89	133	84	146	47	23	80	955
	%	8.9	1.46	1.8	9.21	15.4	9.31	13.9	8.79	15.2	4.9	2.4	8.3	100
E	f	80	3	36	31	147	90	124	69	141	32	7	45	805
	%	9.93	0.37	4.4	3.85	18.2	11.1	15.4	8.57	17.5	3.9	0.8	5.5	100
P	f	165	17	54	119	295	179	257	153	287	79	30	125	1760
	%	9.37	0.96	3.0	6.76	16.7	10.1	14.6	8.69	16.3	4.4	1.7	7.1	100

1. Discipline 2. Psychiatry 3. Language 4. English

5. Persian 6. Total 7. Total Steps

Overall, as Table 8 demonstrates, 1760 steps were observed in 300 RA abstracts across the three majors of CEE, Psychiatry, and AL in English and Persian with a mean of 5.86. It can be claimed that every abstract, of any field in any language, was, on average, comprised of about six steps. While the Purpose step was the most frequent (16.76%), followed by the Product and Instrument steps (16.3% and 14.6%, respectively), the Generalization, Evaluations, and Definition steps were the least commonly used ones by the authors (0.96%, 1.7%, and 3.06%, respectively).

Disciplinary Variation in Step Distributions

Psychiatry abstracts employed the most steps (692), followed by AL (583) and CEE (485). This indicates that while the average Psychiatry abstract used 6.92 steps, the CEE one used 4.85 steps. Similar to the previous comparisons, AL fell between the two majors with a mean of 5.83. While the most frequent step pattern in the CEE abstracts was Prominence-Gap-Purpose-Instrument-Procedure-Product, the Prominence-Gap-Purpose-Participant-Instrument-Procedure-Product-Conclusion-Implication pattern was the most common one in the abstracts of Psychiatry. In the AL abstracts, the Prominence-Gap-Purpose-Participant-

Instrument-Product-Implication pattern was the most favorable one. It can be seen that their first three common steps were almost the same (Prominence, Gap, Purpose).

Cross-Linguistic Variation in Step Distributions

English abstracts generally took more steps than the Persian ones (i.e., 955 and 805 steps, respectively). The most regular step sequence for the abstracts in English was the Prominence-Gap-Purpose-Participant-Instrument-Procedure-Implication, but in Persian, the Prominence-Purpose-Participant-Instrument-Product step pattern was used the most. Four major divergences are observable between the two languages. First, the frequency of the Gap step varied noticeably from English to Persian. While this step comprised 9.21% of the total steps in the English abstracts, only 3.85% of the Persian steps were for presenting the Gap. Second, the Persian authors used fewer Conclusion-related steps (10.42%) than their English counterparts (15.69%). More specifically, implementing the Evaluation step by English and Persian researchers was different. The English abstracts presented the evaluation of their findings in the last move more than their Persian counterparts (2.4% and 0.86%, respectively). Third, unlike the English abstracts, some Persian abstracts began with definitions. According to Table 8, the Definition step was more favored by the Persian authors in comparison to their English

counterparts (4.47% vs. 1.88%, respectively). The Persian authors tended to define new emerging things or concepts, which are mainly derived from other languages such as English or Arabic, in the abstract section to ease comprehension and avoid any confusion. Finally, no research questions or hypotheses were directly mentioned in the English

abstracts; however, some Persian abstracts did this within the Purpose step.

To analyze the step-level data, a series of chi-square tests of independence were conducted for each step to examine the language and discipline interaction, yielding the following results in Table 9.

Table 9. Language × Discipline Contingency Tests per Step

Step	χ^2	p (two-sided)	Cramér's V	Interpretation
IP	1.87	0.392	0.106	No significant association
IG	8.07	0.017	0.163	Weak to moderate association
ID	12.43	0.002	0.204	Moderate association
IGA	2.00	0.366	0.130	No significant association
P	0.00	0.997	0.005	No significant association
MP	0.05	0.973	0.017	No significant association
MI	0.04	0.977	0.013	No significant association
MPR	0.10	0.951	0.026	No significant association
PR	0.05	0.974	0.014	No significant association
CC	9.35	0.009	0.344	Moderate association
CE	4.61	0.099	0.110	No significant association
CI	9.36	0.009	0.274	Moderate association

Note: significant at $\alpha=.05$.

Analyses of Language × Discipline associations at the step level, as displayed in Table 9, revealed that most steps did not differ significantly across groups. Steps IP, IGA, P, MP, MI, MPR, PR, and CE showed no statistically significant associations, with χ^2 values near zero and very small effect sizes (Cramér's V < .15), indicating that their distributions were largely stable across languages and disciplines. Three steps demonstrated meaningful variation. Step IG exhibited a weak-to-moderate association ($\chi^2 = 8.07$, $p = .017$, V = .163), suggesting modest but detectable differences across Language × Discipline combinations. More substantial patterns emerged for Steps ID and CC, which showed significant associations with moderate effect sizes (ID: $\chi^2 = 12.43$, $p = .002$, V = .204; CC: $\chi^2 = 9.35$, $p = .009$, V = .344), indicating that their usage varies systematically by linguistic and disciplinary context. Step CI also showed a moderate

association ($\chi^2 = 9.36$, $p = .009$, V = .274), pointing to similar cross-group variation. Taken together, these findings suggested that while most steps in Hyland's model function relatively consistently across English and Persian abstracts and across the three disciplines, a subset, particularly IG, ID, CC, and CI, reflects meaningful cross-linguistic or cross-disciplinary rhetorical differences.

Move-Pattern Preferences and Probabilities

The study's final research question attempted to identify the most conventional RM sequences of the RA abstracts from distinguished journals within the three distinct fields of CEE, Psychiatry, and AL in English and Persian from 2022 to 2024. To address this question, the researcher extracted and examined the patterns of abstracts one by one, following Hyland's (2000) framework for RM patterns (Table 10).

Table 10. Abstract RM Patterns Across Different Disciplines and Languages

D ¹	L ³		I-P- M- PR-C	P-M- PR-C	P-M- PR	I-P- M- PR	I-P- PR- C	I-P- PR	I- M- PR- C	P- M	P- PR	I- P- M- C	I- P- M	O ⁷	T ⁸
CEE	E ⁴	f	10	1	6	28	1	0	0	1	1	2	0	0	50
		%	20	2	12	56	2	0	0	2	2	4	0	0	100
	P ⁵	f	3	3	17	15	0	4	0	0	1	0	3	4	50
		%	6	6	34	30	0	8	0	0	2	0	6	8	100
	T ⁶	f	13	4	23	43	1	4	0	1	2	2	3	4	100
		%	13	4	23	43	1	4	0	1	2	2	3	4	100
P ²	E	f	35	13	0	0	0	0	2	0	0	0	0	0	50
		%	70	26	0	0	0	0	4	0	0	0	0	0	100
	P	f	29	19	0	0	0	0	0	0	0	0	0	2	50
		%	58	38	0	0	0	0	0	0	0	0	0	4	100
	T	f	64	32	0	0	0	0	2	0	0	0	0	2	100
		%	64	32	0	0	0	0	2	0	0	0	0	2	100
AL	E	f	29	14	1	4	1	0	0	0	0	1	0	0	50
		%	58	28	2	8	2	0	0	0	0	2	0	0	100
	P	f	9	1	8	23	1	4	0	0	0	0	0	4	50
		%	18	2	16	46	2	8	0	0	0	0	0	8	100
	T	f	38	15	9	27	2	4	0	0	0	1	0	4	100
		%	38	15	9	27	2	4	0	0	0	1	0	4	100
Total	E	f	74	28	7	32	2	0	2	1	1	3	0	0	150
		%	49.33	18.66	4.66	21.33	1.33	0	1.33	0.66	0.66	2	0	0	100
	P	f	41	23	25	38	1	8	0	0	1	0	3	10	150
		%	27.33	15.33	16.66	25.33	0.66	5.33	0	0	0.66	0	2	6.66	100
	T	f	115	51	37	70	3	8	2	1	2	3	3	10	300
		%	38.33	17	12.33	23.33	1	2.66	0.66	0.33	0.66	1	1	3.33	100

1. Discipline 2. Psychiatry 3. Language 4. English

5. Persian 6. Total 7. Out of Order 8. Total Abstract

Analysis of the abstracts suggested the existence of 11 move patterns, four of which most frequently appeared in the corpora. Only a few abstracts (10 out of 300, 3.33%) did not follow any particular move patterns and were considered out-of-order abstracts. As illustrated in Table 10, the authors employed the pattern of five moves, Introduction-Purpose-Method-Product-Conclusion, in their abstracts as the most frequently used one (38.33%). The next three commonly used patterns were Introduction-Purpose-Method-Product (23.33%), Purpose-Method-Product-Conclusion (17%), and Purpose-Method-Product (12.33%).

Disciplinary Variation in Move Sequences

The majority of the Psychiatry abstracts followed the most standard patterns; around 96% used either the Introduction-Purpose-Method-Product-Conclusion (64%) or Purpose-Method-Product-Conclusion (32%) pattern. Moreover, there was a substantial difference between the CEE and Psychiatry abstracts concerning their RM patterns. While the most regular sequence in the former major was Introduction-Purpose-Method-Product (43%), no single abstract was found in the latter implementing this pattern. The AL abstracts fell somewhere between the two again, using this pattern as the second most common pattern (27%). However, the five-move order, with 38% frequency, was the most preferred move pattern among AL researchers. Overall, the Psychiatry abstracts

had the most standard and uniform move patterns with only a few minor deviations.

Cross-Linguistic Variation in Move Sequences

Purpose-Method-Product was the most common pattern among the Persian abstracts of CEE, accounting for 34%. A perceptible difference between the abstract move patterns in English and Persian was that there were no non-canonical sequences in English, whereas 10 (6.66%) Persian abstracts deviated from canonical move sequencing, including partial or atypical move realizations. For example, some Persian abstracts used only one or two moves, some had only an introduction instead of an abstract, and others used moves in the non-canonical positions. A recurrent deviation

involved the realization of the Purpose move prior to the Introduction move. Some Persian abstracts were organized in more than one paragraph. Another difference was seen in the length of Move 4, as Persian Product moves were generally shorter than their English counterparts. There was more discrepancy among the Persian abstracts, particularly in the field of AL, compared to the English abstracts regarding their RM patterns.

To quantify move pattern differences, predicted probabilities were computed directly from observed proportions, with 95% CIs based on normal approximation. Table 11 shows the predicted probabilities of common move patterns by language and discipline.

Table 11. Predicted Probabilities of Predominant Move Patterns by Language and Discipline

Discipline	Language	p (I-P-M-PR-C)	95% CI	p (P-M-PR-C)	95% CI	p (I-P-M-PR)	95% CI	p (P-M-PR)	95% CI
CEE	English	0.20	[0.089, 0.311]	0.02	[0.000, 0.059]	0.56	[0.422, 0.698]	0.12	[0.030, 0.210]
	Persian	0.06	[0.000, 0.126]	0.06	[0.000, 0.126]	0.30	[0.173, 0.427]	0.34	[0.209, 0.471]
Psychiatry	English	0.70	[0.573, 0.827]	0.26	[0.139, 0.381]	0.00	[0.000, 0.060]	0.00	[0.000, 0.060]
	Persian	0.58	[0.443, 0.717]	0.38	[0.246, 0.514]	0.00	[0.000, 0.060]	0.00	[0.000, 0.060]
AL	English	0.58	[0.443, 0.717]	0.28	[0.156, 0.404]	0.02	[0.000, 0.059]	0.08	[0.005, 0.155]
	Persian	0.18	[0.071, 0.289]	0.02	[0.000, 0.059]	0.16	[0.058, 0.262]	0.46	[0.322, 0.598]

As illustrated in Table 11, across all disciplines, the four predominant move patterns showed clear and interpretable differences by language. Psychiatry displayed the highest degree of pattern standardization: English abstracts in this corpus favored the canonical I-P-M-PR-C pattern ($p = .70$, 95% CI [.57, .83]), with Persian abstracts showing a similarly strong preference ($p = .58$, 95% CI [.44, .72]). In CEE, English abstracts showed more dispersion across patterns, with I-P-M-PR dominating ($p = .56$) and I-P-M-PR-C

occurring less frequently ($p = .20$). Persian CEE abstracts showed a more balanced distribution, with I-P-M-PR ($p = .30$) and P-M-PR ($p = .34$) both common.

In AL, English abstracts showed a strong preference for I-P-M-PR-C ($p = .58$), while Persian abstracts distributed more broadly across patterns, most notably P-M-PR ($p = .46$, 95% CI [.32, .60]). Zero-frequency patterns (primarily in Psychiatry and AL) had appropriately narrow CIs, indicating rare usage (0-0.06).

Overall, the predicted probabilities and their CIs demonstrate substantial Language $\times$ Discipline variation in pattern selection, with Psychiatry showing the highest conventionalization and AL displaying considerable cross-linguistic divergence.

Discussion

This study yielded three principal findings within the examined corpus. First, the presence and distribution of RMs varied systematically by discipline and language, with Psychiatry abstracts exhibiting the highest concentration of canonical move realizations and CEE abstracts showing greater dispersion. Second, step-level analysis revealed fine-grained rhetorical variation that was not visible at the move level, particularly in the realization of Introduction-, Method-, and Conclusion-related steps. Third, predicted move-pattern probabilities demonstrated clear Language $\times$ Discipline interactions, most prominently in AL, where cross-linguistic divergence was more pronounced than in the other two disciplines.

At the move level, the findings broadly corroborate earlier genre-analytic research (Pho, 2008; Santos, 1996; Zand-Moghadam and Meihami, 2016; Zand-Moghadam and Zhaleh, 2022). Across languages and disciplines, the Purpose, Method, and Product moves were the most frequently realized, confirming their central role in abstract construction. In contrast, the Introduction and Conclusion moves occurred less consistently, indicating greater flexibility in their deployment. These distributions align with previous reports that abstracts prioritize research aims, procedures, and outcomes while varying in the extent to which backgrounding or evaluative commentary is included.

The prominence of the Product move is consistent with the communicative function of abstracts as concise reports of research outcomes. This tendency is further supported by the near-categorical realization of Product-related steps across disciplines. Similarly, the frequent inclusion of Purpose and Method moves reflects both epistemic expectations

and institutional requirements for clarity in research aims and procedures. The comparatively lower frequency of the Conclusion move, particularly outside Psychiatry, suggests that evaluative or inferential commentary may be perceived as less essential at the abstract stage, a pattern previously noted in comparable corpora (Al-Khasawneh, 2017; Amnuai, 2019; Suntara and Usaha, 2013).

Disciplinary contrasts were especially salient in the realization of the Method move. Psychiatry abstracts employed this move significantly more often than those in CEE and Applied Linguistics, a pattern confirmed by large odds ratios in pairwise comparisons. This finding is consistent with the epistemological orientation of medical research, where participant characteristics, instruments, and procedures are central to evidential credibility. At the step level, the frequent realization of Participant and Procedure steps in Psychiatry abstracts further supports this interpretation, whereas CEE abstracts relied more heavily on Instrument-related steps, reflecting the technological focus of that discipline.

Marked disciplinary differences were also observed in the realization of Conclusion-related steps. Within this corpus, Psychiatry abstracts frequently included both evaluative and implicational elements (e.g., *This is a field that still requires development...* or *Future studies will need to confirm whether...*), whereas AL abstracts tended to merge conclusions with implications (e.g., *The implications of this research may inform ...*), often omitting explicit evaluation. CEE abstracts minimized evaluative commentary to an even greater extent. These differences correspond to the moderate Language $\times$ Discipline associations observed for Conclusion and Implication steps and suggest discipline-sensitive preferences in how claims are extended beyond immediate results.

Cross-linguistic variation further nuanced these patterns. English abstracts generally realized moves and steps in more discrete and segmented ways, whereas

Persian abstracts more frequently combined rhetorical functions within single segments. For example, Purpose statements in Persian abstracts were sometimes distributed across multiple sentences or integrated with methodological information. This tendency is illustrated by the following translated excerpt:

Therefore, this research aims to investigate how proverbs are listed in Persian dictionaries, especially in Persian proverb dictionaries, using a cognitive semantics approach. The purpose of this research is to present proverbs in a novel, non-linear, and non-alphabetic way with a scientific basis and based on theory in cultures.

It is worth noting that these patterns point to language-specific rhetorical preferences rather than differences in abstract quality.

Step-level analysis provided insights that were obscured at the move level. Across the corpus, Purpose, Product, and Instrument steps were the most frequent, reflecting the centrality of research aims, outcomes, and tools in abstract discourse. This distribution is partly attributable to the structural properties of Hyland's (2000) model, in which certain moves (Purpose and Product moves) consist of a single step. Accordingly, once such moves are selected, step realization becomes structurally obligatory. This methodological feature constitutes an analytical boundary that must be considered when interpreting step frequencies.

By contrast, steps within the Introduction move showed greater variability. Authors primarily relied on Prominence and Gap steps to contextualize their studies, while Generalization and Definition steps were rare. This pattern suggests a preference for problematization over broad general claims within the spatial constraints of abstracts. Definition steps occurred mainly in studies addressing emerging technologies or novel constructs, where terminological clarification was necessary (e.g., *Internet of Underwater Things (IoUT) is a technology...*).

The findings also revealed that the number of the Prominence step was almost

equal to the number of the Gap step, mostly because the authors tended to initiate their abstracts by stating the significance of the topic and consecutively presenting the existing limitation. However, the way they implemented this pattern was quite different across the majors. The CEE abstracts used the Gap step distinctly from the other two disciplines. While in the CEE abstracts, this step was utilized to point out challenges or limitations with a particular device, technology, method, etc., followed by proposing a novel alternative; the Psychiatry and AL abstracts used this step to address a gap or lack of research in the literature. The move marker 'however' was the most common word to connect the Prominence step to the Gap one in the corpora.

Although there was no considerable difference among the three disciplines in the frequency of the Purpose step, this step was presented differently. While in CEE, expressions such as *we propose* or *we introduce a method* were often used, in Psychiatry and AL, expressions like *the study aimed to explore* or *investigate* were often used. Furthermore, based on the examples above, personal pronouns, namely *I* or *we*, appeared more often in CEE compared to Psychiatry and AL when stating the purpose of the research.

Disciplinary variation at the step level was particularly evident in the Method move. Psychiatry and AL abstracts frequently employed the Participant step, reflecting the importance of individual and contextual variables in medical and social research. In contrast, this step was largely replaced by the Instrument step in CEE abstracts, where human participants are often irrelevant. The Procedure step appeared mainly in experimental studies, suggesting that methodological design influences step selection.

Regarding move sequencing, the results align with earlier studies (Amnuai, 2019; Zand-Moghadam and Zhaleh, 2022) in identifying the Introduction–Purpose–Method–Product–Conclusion pattern as the

most frequently observed canonical sequence within Hyland's framework. When considering the first move optional and the rest obligatory, just the Introduction-Purpose-Method-Product-Conclusion and Purpose-Method-Product-Conclusion organizations, among others, should be treated as standard. Consequently, the results showed that almost half of the abstracts (i.e., 166 abstracts, 55.33%) used the moves in a standard way, 115 of which were completely in line with the five-move pattern recommended by Hyland (2000). It supports the idea that some researchers regard all five moves of this model as pivotal for writing a standard RA abstract. However, substantial variation was also observed, particularly in CEE and Persian AL abstracts, where shorter or partial sequences were common. These findings indicate that while canonical patterns are prevalent, especially in Psychiatry, alternative configurations remain acceptable within the examined journals.

Finally, while the observed patterns align with disciplinary epistemologies, several alternative explanations and confounding factors must be acknowledged. One important factor is abstract format: structured abstracts, which were common in the Psychiatry sub-corpus, likely facilitate explicit realization of Conclusion-related steps. Journal policies regarding abstract length and required components may also constrain rhetorical choices. These institutional factors caution against attributing all observed variation solely to disciplinary norms. Accordingly, the interpretations offered here are bounded by the corpus design, which comprises six journals across a three-year window, and should be generalized with care.

Conclusion and Implications

This study examined RA abstracts from cross-disciplinary and cross-linguistic perspectives, analyzing move-level, step-level, and move-pattern distributions in 300 English and Persian abstracts drawn from high-impact journals in CEE, Psychiatry, and AL. The findings support the analytical utility of Hyland's (2000) model while extending it

through a finer-grained step-level analysis and probabilistic patterning. Together, these layers of analysis provide a more nuanced account of abstract rhetoric than move-level analysis alone.

From a theoretical perspective, the study offers evidence that disciplinary variation in abstract writing is manifested not only in the presence or absence of RMs but also in the internal configuration and frequency of steps within those moves. Within the present corpus, Psychiatry abstracts showed a higher concentration of Participant- and Conclusion-related steps, consistent with the empirical and human-subject orientation of medical research. In contrast, CEE abstracts foregrounded Purpose and Instrument steps, reflecting a problem-solution and technology-driven research paradigm. AL abstracts displayed greater variability, particularly across languages, indicating a less rigid conventionalization of abstract structure in this discipline. These findings suggest that disciplinary epistemologies are reflected in recurring rhetorical tendencies rather than fixed or universal patterns.

Cross-linguistic variation further qualified these disciplinary tendencies. Differences in the realization of Definition and Gap steps between English and Persian abstracts point to language-specific rhetorical conventions that persist even in internationally indexed journals. Such variation should not be interpreted as a deficit in abstract quality but rather as evidence of alternative rhetorical strategies shaped by academic writing traditions and linguistic norms.

The findings also carry implications for academic writing instruction and English for Academic Purposes (EAP) pedagogy. Rather than prescribing uniform abstract templates, instruction may benefit from emphasizing discipline-sensitive rhetorical options and highlighting areas of flexibility and constraint within specific publication contexts. Awareness of common move sequences and step realizations in target journals can help

writers make informed rhetorical choices when preparing abstracts for submission. In particular, Psychiatry abstract writers should employ the full I-P-M-PR-C pattern, ensuring detailed Participant and Conclusion/Implication steps. Writers in CEE should focus on the I-P-M-PR pattern, emphasizing the Purpose and Instrument steps; the Conclusion move is often optional. While the I-P-M-PR-C pattern is common in AL, authors should be aware of cross-linguistic differences; Persian abstracts may more frequently use the P-M-PR pattern and include Definition steps.

Students, graduates and researchers who are interested in publishing their research articles (RAs) in scholarly journals need to be aware of the typical structure of articles in their specific disciplines in English and their first language, as used by professional researchers in reputable journals. By familiarizing themselves with these conventions, they can become active members of their professional discourse communities, increasing the likelihood of their manuscripts being approved for publication in decent journals. On the other side, those who are concerned with studying scientific articles can benefit more from these sources if they gain an understanding of the various genres within a specific discipline in both English and their native language.

Like any other investigation, the present research faced several limitations. First, the corpus was limited to six journals across a three-year publication window, and the findings should therefore be interpreted as reflecting localized practices rather than universal disciplinary conventions. Further studies are required to collect more data from various journals of different disciplines in different languages during different periods. Second, while journal selection was based on explicit criteria, potential selection bias exists as the corpus was limited to reputable, indexed journals. The findings may not generalize to journals of lower tiers or different indexing status. Third, the study did not control the length and type of abstracts

and journals' guidelines for abstract writing. While the study aimed for methodological consistency by focusing primarily on unstructured abstracts, the inclusion of structured abstracts in the Psychiatry discipline represents a potential limitation. The explicit headings in structured abstracts (e.g., Objective) may influence authors' inclusion of specific moves more systematically compared to unstructured formats. Although the analysis focused on rhetorical content rather than structural format, future research could specifically investigate how abstract structure (structured vs. unstructured) interacts with RM realization across different disciplines and languages. Fourth, this research utilized only Hyland's (2000) framework as an instrument for analyzing the data. Nonetheless, various models have been suggested in the literature for this goal. Future studies can be conducted using other well-established models to investigate the RMs of abstracts. Fifth, only RMs and steps of RA abstracts were examined in this paper. Other aspects of abstract writing remained unexplored. Thus, more research is required to look into such aspects as lexical and syntactic structures and punctuation of RA abstracts. Research, for instance, can be done to explore the frequent move makers of RA abstracts. This inquiry sought to delve into the RMs of only the abstract section of articles. Additional research is also necessary to explore the RMs in other parts of papers, such as the introduction, literature review, research methods, etc., as these sections are also worth examining. Finally, the relationship between the RMs and other internal textual features like formulaic language, thematicity, nominalization, or other in-clause features like projected clauses can be explored by future studies.

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A.1 Move and Step Definitions

The study adopted Hyland's (2000) five-move model, operationalized as follows:

Five Moves

Move	Code	Function	Example
Introduction	I	Establishes research context and motivates the study	<i>What seems to be overlooked in current higher education research is...</i>
Purpose	P	Explicitly states the aim, objective, or research focus of the study	<i>The objective of the study is to evaluate...</i>
Method	M	Describes how the study was conducted	<i>A retrospective cohort study was conducted in...</i>
Product	PR	Reports main findings or outcomes	<i>The experimental results show that...</i>
Conclusion	C	Interprets, evaluates, or extends findings	<i>tCBT added to TAU appears to be cost-effective...</i>

Steps Within Move 1

Step	Code	Operational Definition	Example
Prominence	IP	Claims importance, relevance, or topicality of the research area	<i>Teacher motivation is pivotal in...</i>
Generalization	IG	Describes general background, trends, or established knowledge	<i>Breast cancer is one of the most common causes of deaths...</i>
Definition	ID	Defines concepts, terms, constructs, or processes	<i>Internet of underwater things (IoUT) is a technology...</i>
Gap	IGA	Identifies a problem, limitation, or absence in prior research	<i>...relatively few studies have been undertaken to investigate...</i>

Steps Within Move 3

Step	Code	Operational Definition	Example
Participants	MP	Specifies participants, data sources, corpora, or samples	<i>...with a sample of 242 second-year students from a Chinese high school.</i>
Instrument	MI	Describes tools, materials, instruments, or datasets	<i>...in a questionnaire survey, an end-term English exam, and a Cambridge English proficiency test.</i>
Procedures	MPR	Explains design, procedures, analytical methods, or conditions	<i>...were administered immediately after exposure to the input material and after a 2-week interval...</i>

Steps Within Move 5

Step	Code	Operational Definition	Example
Inference	CC	draws inferences from the findings	<i>...it is expected that as more evidence emerges...</i>
Evaluation	CE	Assesses significance, contribution, or value	<i>The current results are the first to describe...</i>
Implication	CI	Suggests applications, recommendations, or future research	<i>These results will help...</i>

A.2 Borderline Cases and Decision Rules

Because abstract discourse is compressed, certain distinctions require explicit decision rules.

Definition (ID) vs. Generalization (IG)**Rules:**

- Code as Generalization (IG) if the clause describes accepted knowledge or background without specifying meaning.
- Code as Definition (ID) if the clause explicitly explains what a term, construct, or process means.

Examples:

(ID) *Fibromyalgia syndrome (FMS) is a chronic musculoskeletal pain syndrome characterized by extensive pain, tender points, fatigue, and sleep disturbance, with unknown etiology.*

(IG) *Breast cancer is one of the most common causes of deaths.*

Introduction (I) vs. Purpose (P)**Rules:**

- Code as Purpose (P) only if authorial intent is explicitly stated.
- Topic statements without intent markers remain Introduction.

Examples:

(I) *Fibromyalgia syndrome (FMS) is a chronic musculoskeletal pain syndrome...* (P) *This study aims to investigate the effect of...*

A.3 Coding Workflow Summary

1. **Training and Calibration:** Familiarization with move-step definitions and pilot coding. Discussion of borderline cases and refinement of decision rules.
2. **Primary Coding:** Clause-level coding of all abstracts.
3. **Dual-Move Identification:** Coding clauses with two rhetorical functions as DMs.
4. **Reliability Check:** Independent coding of 30% of the corpus.
5. **Adjudication:** Resolution of disagreements through consensus.
6. **Final Coding Lock:** Dataset finalized prior to inferential analyses.

The author has read and approved the final manuscript.

Автор прочитал и одобрил окончательный вариант рукописи.

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Vahid Shahidipour, PhD in Applied Linguistics, Assistant Professor, Head of English Department, Mofid University, Qom, Iran.

РАЗДЕЛ II. ЛИТЕРАТУРЫ НАРОДОВ МИРА SECTION II. WORLD LITERATURES

UDC 82-344

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Olga P. Alekseeva¹
Oksana I. Ivanova²

The Chinese mythological archetypes of images in Rebecca Kuang's
novel *The Poppy War*

¹ Russian University of Transport,
9 Obraztsov St., Moscow, 127994, Russia
E-mail: olgaalekseeva@yahoo.com
ORCID: 0000-0001-7776-834X

² M. K. Ammosov North-Eastern Federal University,
58 Belinsky St., Yakutsk, 877000, Russia
E-mail: oi.ivanova@s-vfu.ru
ORCID: 0000-0003-2414-4642

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Abstract. The article focuses on the study of Chinese mythological archetypes in R. F. Kuang's trilogy *The Poppy War*, that contribute to a deeper understanding of the cultural and psychological aspects of the novels. *The Poppy War*, as a good example of the contemporary fantasy genre, is understudied in the context of Jungian analysis. The problem arises from the need to reveal the integration of mythological archetypes in the narrative's structure and the archetype's nominations impact on the characters' storyline interpretation. The research is carried out using Jungian hermeneutics, analytical psychology, and the interpretative strategies of E. M. Meletinsky and E. Neumann. The authors come to the conclusion that key Chinese mythological archetypes such as the Dragon, the Phoenix, Sun Wukong, Zhu Bajie and Nüwa play a significant role in shaping the characters and the plot of the trilogy. Particular attention is given to the main character, Fang Runin, whose evolution personifies the Phoenix archetype. The heroine, rejecting femininity, follows the path of the Warrior, her journey is characterized by the search and interaction with such archetypes as the Shadow and the Animus leading to her personal transformation. Thus, the traditional Chinese mythological archetypes behave simultaneously as the Shadow and the Animus in the character's psyche, creating a specific combination and shaping the narrative. The integration of mythological elements in *The Poppy War* gives the trilogy a deep symbolic richness and multi-layeredness that proves that the archetypal components of traditional Chinese culture and the Chinese heroic archetype influence modernity.

Keywords: The Poppy War; Kuang; Archetypes; Jung; Collective unconscious; The Shadow; The Phoenix

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Алексеева О. П.¹
Иванова О. И.²

Китайские мифологические архетипы образов романа Ребекки
Куанг «Опиумная война»

¹ ФГАОУ ВО «Российский университет транспорта (МИИТ)»
ул. Образцова, 9, Москва, 127994, Россия
E-mail: olgaalekseeva@yahoo.com
ORCID: 0000-0001-7776-834X

² ФГАОУ ВО «Северо-Восточный федеральный университет имени М.К. Аммосова» 58 ул.
Белинского, 58, Якутск, 677000, Республика Саха (Якутия), Россия
E-mail: oi.ivanova@s-vfu.ru
ORCID: 0000-0003-2414-4642

*Статья поступила 26 августа 2025 г.; принята 15 марта 2026 г.;
опубликована 30 марта 2026 г.*

Аннотация: Статья посвящена анализу китайских мифологических архетипов в трилогии Р. Ф. Куанг «Опиумная война», способствующему более глубокому пониманию культурных и психологических аспектов романов. «Опиумная война», являясь ярким примером современного фэнтези, недостаточно изучена в контексте юнгианского анализа. Проблема обусловлена необходимостью выявления особенностей интеграции мифологических архетипов в структуру повествования и влияния номинаций архетипов на интерпретацию сюжетных линий персонажей. Исследование базируется на юнгианской герменевтике, аналитической психологии, а также интерпретационных стратегиях Е. М. Мелетинского и Э. Нойманна. Авторы приходят к выводу, что ключевые китайские мифологические архетипы, такие как Дракон, Феникс, Сунь Укун, Чжу Бацзе и Нюйва, играют значительную роль в формировании образов и сюжета трилогии. Особое внимание уделяется главной героине Фан Руинь, эволюция которой олицетворяет архетип Феникса. Героиня, отказавшись от феминности, выбирает судьбу Воина, её путь характеризуется поиском и взаимодействием с такими архетипами, как Тень и Анимус, что приводит к личностной трансформации героини. Таким образом, традиционные китайские мифологические архетипы одновременно выступают в качестве Тени и Анимуса в психике героини, создавая уникальную комбинацию и формируя повествование. Интеграция мифологических элементов в «Опиумной войне» придаёт трилогии глубокую символическую насыщенность и многослойность, что свидетельствует о влиянии архетипических компонентов традиционной китайской культуры и китайского героического архетипа на современность.

Ключевые слова: Опиумная война; Куанг; архетипы; Юнг; коллективное бессознательное; Тень; Феникс

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Introduction

The structure and key aspects of Chinese universe and mind-set are based on well-known archetypes, which are deeply entrenched in literature. The framework of the epic trilogy of R. F. Kuang *The Poppy War* implicates the cultural archetypes implemented in the novel's images. The usage of identifiable and specific characters' set of traits makes this fantasy narrative artform globally widespread and understandable.

The aim of the study is to analyze the main features of the integration of the mythic archetypes in the modern literary text. The results of the research contribute to the Chinese socio-cultural-specific conceptual representations in the context of the theory of the archetypes.

The characteristics of the integration of archetypes in the contemporary fantasy novel structure in the creation of an artistic image and its impact on the characters perception and interpretation has not been sufficiently studied, particularly using the Jungians analyses approach.

The mythological archetypes of the Mother, the Orphan, the Shadow, the Anima and the Animus are schemes, implications and opportunities for literary images. R. F. Kuang uses these forms to create the characters in accordance with Chinese mythological tradition. The main novels' characters have distinct features of pre-images of the Dragon, the Phoenix, Sun Wukong (Monkey King) and Zhu Bajie (Piggy).

The archetypes of the Phoenix and the Dragon symbolize the Chinese concepts of Yang and Yin in the main characters Fang Runin and Yin Nezha opposition.

The ideas of K. G. Jung formulated in *The Archetypes and the Collective Unconscious* set the methodological ground of the research. The founder of the analytical psychology develops the theory of the collective unconscious, which he describes as a deeper common layer of the psyche that is "not a personal acquisition but is inborn" (Jung, 1980: 3). Archetypes are universal psychic structures and archaic heritage. The

insight in Jungian narrative of unconscious gives us opportunity to interpret archetype as realized with symbols and images forms that become deeply rooted in cultural patterns of myths and fairy-tales (Alekseeva, 2006: 9).

K. G. Jung uses the term "individuation" which is defined as the process of personal self-development and self-awareness based on the combinations of humans conscious and unconscious aspects (Jung, 1980: 490). Archetypes imprint the thoughts and behavior of the people and understanding of its structures contribute to personality growth and psychotherapeutics.

Jung's followers study the development of the human conscious through the prism of Jungians psychology, mythology and symbols, systematizing the archetype theory. One more consideration is given to the Shadow archetype, the person's unconscious features. The primary function of this archetype is "to destroy" the Hero's Journey (Voytilla, 1999: 107). Although the Shadow's integration with conscious identity, with the ego is the essential path towards wholeness and self-actualization and only those, who deal with their own shadow can do something real for the world (Casement, 2026: 30).

E. M. Meletinsky investigates the ideas of collective unconscious and focuses on the significance of the relationship of inner world of a man and the environment and states that the external world creates the grounds for describing purely internal conflicts. From this point of view, the connections and confrontations between personality and society appear to be more relevant than the relationship between the conscious and unconscious principles in the soul (Meletinsky, 2001: 73).

An archetype, as a rule, is a certain conditional invariant in an endless series of images integrated into certain narrative plots (Sannikov, 2018: 65). An archetype is a "language" in which the "content" of an artistic message is conveyed. The author writes in a certain way, but often does not realize what is happening, since archetypes are fundamentally outside the sphere of

consciousness and the author's purposeful will (Tun, 2022: 53).

E. Neumann explains the way archetypes influence the personality growth. Analyzing myths and legends of different cultures, he reveals the common archetypical motifs and symbols, which reflect the stages of conscious development. This development is similar to the way the humankind moves from mythological to rational thinking. In this movement, the hero myth phase is "a radical shift" with its focus on the man instead of the universe and so "the hero is the archetypal forerunner of mankind in general" and "the stages of the hero myth have become constituent elements in the personal development" (Neumann, 2014: 131). In the hero's transformation, the stage of separation from the Mother is significant. This separation can be seen in the scenes of struggling with parents or fighting the Dragon.

According to J. Campbell, the main task of the Hero is "to give battle to the nursery demons and break through to the undistorted, direct experience and assimilation of the archetypal images" (Campbell, 2004: 15). If we deal with the mythological Hero his standard path can be seen as the formula "represented in the rites of passage: separation – initiation – return: which might be named the nuclear unit of the monomyth" (Campbell, 2004: 27).

Thus, the universal monomyth is the Hero journey as symbolic personal growth. The main stages of the journey are structured in the research of V. Propp. Based on the study of various folklore genres, he distinguishes nine stages of the process: departure, the Hero's testing, the Hero's reactions of the future donor, acquisition of the magical agent, getting of an object of search, direct combat of the Hero and the Villain, the Villain defeat, liquidation of lack or misfortune and returning of the Hero [Propp, 2009: 24]. V. Propp treats these actions as functions. Not only folk tales but also all literary fairy tales comply with these common rules or functions progression

although not all of them have the full range of Propp's functions (Alekseeva, 2008: 89).

M. Murdock undertakes rethinking of the traditional mythological structure of the Hero's journey in the context of female experience. The author creates an alternative model that takes into account the unique challenges and transformations that women face in their life journeys, emphasizes the importance of the feminine aspects of the psyche, and offers a path to personal and spiritual growth through awareness and integration of the various aspects of female personality (Murdock, 2020).

The special interest to the Heroine archetype is proven by further works of M. Tatar who revises the concept of female heroism, rooted in foundational texts. The examination of the images of the female characters in mythology and folklore can give deep understanding of the way the archetypes form and reflect cultural ideas about women and their role in society. M. Tatar examines numerous heroines' archetypes from classic fairy-tale princesses to modern pop culture characters, representing their self-realization stages. The early canon reveals women's silence, the lack of self-actualization through language, and in some way, the narratives' heroines are socially marginalized and exploited (Tatar, 2021: 7). The time moves on and modern heroines in fiction and culture are "crazy fighters for the idea" (Lisbeth Salander, the heroine of "Millennium" by S. Larsson), "resourceful avengers" (Mildred Hayes, the character of "Three Billboards on the Ebbing, Missouri Border"), killers (the girl from "Hannah. Perfect Weapon", 'warrior women' (Arya Stark from the HBO series "Game of Thrones"), etc.

Main part

The purpose of the study is to specify the manifestations of mythological archetypes integration in the structure of the narration in the trilogy *The Poppy War* and characters' development.

Materials and Methods

The research is implemented on the basis of the award-winning contemporary

writer R. F. Kuang's trilogy *The Poppy War* (2018), *The Dragon Republic* (2019) and *The Burning God* (2020). The choice of the material is imposed by the fact that the novels represent the modern perception of social-cultural elements of China reflecting the specific syncretic synergy of the shamanism, mythology, Taoism and Old Chinese traditions of fortune telling.

Jungian hermeneutics provides the framework for our interpretation of the novels' texts, enabling us to understand the symbolic language of the unconscious as it manifests in the narrative.

C. P. Estes's "Wild Woman" manifestation of the archetypes in contemporary women characters has provided additional analytical tools for interpreting the characters and *The Poppy War* narrative.

The qualitative description method that is used allows to eliminate the deep archetypes structures and characteristics regarding the context.

Results and Discussion

The image of the main character of *The Poppy War* Fang Runin is based on the key Chinese archetype of the Phoenix.

In ancient Egypt and Greece, the Phoenix was associated with the Sun and was a bird of the Sun (Geng, 2020: 130). M. Wang states that in China the first references to the Phoenix are recorded in the Book of History in the 10th century BC. The creature "with a rooster's head, a snake's neck, a swallow's crop, a turtle's back, a fish's tail" serves as a totem and acquires a mythological nature. Absorbed with characteristics of various animals, it becomes associated with the moral system of Chinese society. The patterns in the form of the hieroglyph on different parts of the bird's body are interpreted as "virtue" (on the head), "obedience" (on the wings), "justice" (on the back), "trust" (on the stomach) and "humanity" (on the chest) (Wang, 2020: 8). It is believed that the Phoenix, with its image extracted from different animals, plants or organisms, must have been an abstract symbol of primitive people expressing their lives (Xinyu and

Muhsin, 2020: 13). Nowadays, the Phoenix serves as a sort of Chinese ethnic cultural marker – "to metaphorize and symbolize personal fates and ethnic identity" (Miao and Shi, 2023: 2).

The plot of *The Poppy War* correlates to the main functions of any fairy tale. The modeling of the tale's structure proposes an algorithm that determines the hidden logic inherent in individual variants of the phenomenon (Alekseeva, 2008: 87). All the tales begin with an initial situation, which is not a function, but has an important morphological meaning. Fang Runin (Rin) is an orphan; she is brought up in the Fan family of opium traders. The supposed 'low', unpromising heroine gradually reveals her heroic essence, triumphs over enemies and rivals. To prevent Rin's adoptive parents from marrying her a rich merchant three times her age, the girl passes the difficult exam and enters the most prestigious educational institution in the Nikan Empire – the military academy in Sinegard. At the military academy, Rin is immediately disliked by a young man from a wealthy family, the son of the governor of the Dragon Province Nezha. During a fight with him, Rin first feels a strong internal heat, she is close to die but her future mentor Jiang helps her. Master Jiang chooses the girl as his cadet and begins to teach her shamanism and dealing with the Phoenix God. Soon war breaks out between Nikan and the Mugen Federation, and the understudied students of the military academy are forced to fight. Rin with the support of the Phoenix fights selflessly, but she is betrayed by Nezha.

The girl wakes up in the prison, chained to the wall. Her friend, Kitay tries to help her and unable to unlock the shackles on her right hand with a key, he has to break the bones of her hand, which later leads to the amputation of her right hand.

Fang Runin becomes a channel for the Phoenix, the deity of fire, but in doing so, she loses her subjectivity, dissolving into the destructive will of myth. The girl's initiation occurs not through spiritual maturity, but

through physical and moral suffering. Her transformation is not an exaltation, but an absorption into myth (Ivanova, 2025: 22).

The heroine's hands amputation is an archetypal element of the plot. A hand cutting is a bloody sacrifice, which in ancient times meant a complete descent into the underworld. When a woman's hands are cut off, it means she is cut off from self-consolation, from instant self-healing and therefore unable to do anything but follow her eternal path. According to C. P. Estes, true self and inner strength are achieved when contemporary women reconnect with their innate, instinctual "wild" nature (Estes, 1996: 359). In the same way, Fang Runin follows her way, takes responsibility for the decisions. Her firmness does not disappear throughout the novel, she goes forward, never softens, and blazes with rage towards her enemies.

Thus, the process of individuation for Fang Runin unfolds through several key stages rooted in archetypes and mythological imagery. Rin's individuation begins in her childhood with her orphaned status. The hero's lowly position is always given a social colouring, usually within the family. Examples include orphans, younger sons, younger daughters and stepdaughters (persecuted by an evil stepmother). This is important for the construction of the narrative. The archetypal image of an orphan is a harmonizing principle in a literary fairy tale (Zhanysbekova and Safronova, 2024: 172). The Orphan becomes the epicenter of a vision, suggesting that only through the inherent goodness, love, and gratitude true harmony can be restored. Thus, the Orphan archetype functions not merely as a signifier of hardship, but as a potent symbol of moral and spiritual regeneration.

The Poppy War presents Rin as an embodiment of the Orphan Child archetype, marked by the pain of her early life. This vulnerable status becomes the key to her future as a world-saving figure. The Orphan archetype, in this context, is not simply a figure of pity, but rather a powerful symbol of moral authority and the potential for

transformative change arising from unexpected sources.

Rin has experienced pain and trauma since birth. This trauma accompanies the girl throughout her individuation. The heroine faces cruel and malevolent guardians who intend to marry her off to an elderly, wealthy merchant, a local import inspector specializing in pig ears and shark fins. The conflict with the Fangs and her decision to enter the military academy symbolize her struggle for freedom and self-realization. She undergoes numerous trials and overcomes internal and external obstacles, a classic stage in the mythological 'Hero's Journey' as described by Joseph Campbell.

At Sinegard, she struggles to shed her past in Tikany village in Rooster Province, fights her strong southern accent, and dons the persona of the top student, thus encountering the Persona archetype. Rin's individuation is also linked to the Phoenix archetype, which becomes the Shadow side of the heroine. The Phoenix is associated with the trauma of the entire Nikanese people, oppressed by both the Mugenese and the Hesperians.

Another archetype of great interest is the Warriorress. We agree with I. M. Djakonov that some scholars underscore the necessity of differentiating, within mythology and the pantheon, the function of the Resident (Mother, Spouse) from the function of the Maiden which must be understood not merely as 'Virgin', but more broadly as 'Warriorress' who generates the impulse for aggression and overcoming of the obstacles (Djakonov, 1990: 89).

Fang Runin as the Warriorress is notably unattractive. E. A. Kulikov, rethinking the social pressures of the modern East, observes that Rin is significantly darker-skinned than the average Nikan, who typically possesses the white, porcelain complexion so highly valued in Asian society. Dark skin here signifies an ordinary country woman, spending her days in agricultural labor outside (Kulikov, 2022: 415). When Rin experiences menarche, she opts for a potion that eradicates

her uterus, being aware that this choice precludes marriage and motherhood. In “killing the woman inside”, she becomes unattractive to men.

Deep inside Rin may yearn for affection, but she is a warrior. The girl often appears unkempt, even dirty, with short, disheveled hair. The archetypical Sinewardian beauty, Venka, Rin's classmate, laugh at the village girl who has never learned the art of feminine wiles. Rin dreams of Nezha's kiss, but receives a knife in her back instead.

Rin is incapable of integrating her Shadow in the form of the Phoenix: on the one hand, she experiences immense joy in accessing the powers of this god who burns everything in its path. Conversely, Rin is not in control of the Phoenix; rather, the Shadow controls her, causing her to burn with anger and hatred towards her country's enemies. This renders her incapable of feeling empathy or compassion for the Mugenese civilians killed by the Phoenix.

Regarding the figure of the Animus in the heroine's life, she possesses not one, but three: the spirit Altan, the aristocrat Nezha, and the minister's son, Kitay. Altan functions, especially after his death, as Rin's alter ego, yet this ‘second self’ is often brutally critical of the girl, constantly belittling her. Only closer to the finale this Alter Ego begins to offer support.

Nezha, also a trickster hero associated with the Dragon, embodies Rin's mythological betrothed. However, within the context of the trilogy, the characters are perpetually engaged in rivalry and struggle. This antagonism ultimately culminates in the heroine's suicide.

The third Animus, Rin and Nezha's fellow student Kitay, becomes the heroine's ‘anchor twin’. He is an intellectual, capable of understanding the emotions of others, physically and spiritually weaker than Rin. He draws closer to Rin than any other male characters, understanding her pain and sufferings, rescuing her in moments of crisis, crafting her wings. As her ‘anchor twin’, he perishes at the same time as Rin.

Given that the novel concludes with the Hesperians' victory over the Nikanese and Nezha's mourning over the deaths of Rin and Kitay – rather than a triumph over external and internal enemies and the marriage of the Dragon and the Phoenix – we can decide that the heroine failed to integrate either her Shadow or the images of the Animus. She fails to achieve harmony with the Anima and the Great Mother, and thus, she is unable to gain her Selfhood.

The trinity of images in R. F. Kuang's novels is associated with A. Rubanov's novel *Finist – the Bright Falcon*, written in a genre that can be categorized as Slavic fantasy. Finist is the Slavic equivalent of the Phoenix, while the Falcon, in Slavic epic tradition, is likened to a bird and fires of heaven, which dies or falls asleep for the winter, and then returns to life again.

Three distinct characters, three Ivans, narrate the story of the girl Marya, who falls in love with Finist: the first is the mocker (buffoon) Ivan Koren, the second is the master of making leather armor Ivan Remen, the third comes from the same family of werewolf-birdmen as Finist and his name is Ivan Solovei, or Solovei the Whistler-Robber. All three narrators fall in love with Marya and help her reach her beloved, and on this arduous journey, as expected, she must wear out a pair of iron boots, knock down an iron staff, and gnaw iron bread. The bird-man Ivan Solovei explains that it is not Marya's external beauty that attracted him: “beauty, as I have been convinced many times, comes primarily from the inner light, from the gaze, from the outgoing strength, from the way a person holds herself” (Rubanov, 2020: 462).

The Finist the Bright Falcon plays a passive role both in literary and folk fairy tales. In the Russian fairy tale from the collection of A. N. Afanasyev, the Falcon, once wounded by knives in his attempt to fly through Marya's window, ceases to return to her. All the burdens of searching for a loved one and active actions for three years fall on the shoulders of a fragile girl. Therefore, Marya transcends typical notions of the

Beauty and embodies the archetypal figure of the Warriress driven by internal strength and purpose.

However, in the contrast with Rin, who is stabbed in the back by her beloved shaman-Dragon, Marya is not betrayed by any of the men she meets on her way: neither Finist, the Bright Falcon, nor Ivan Kozhedub, nor Ivan Skomorokh, nor Ivan-Solovei.

Let us focus on the archetypal figure of Nezha, who, in R. F. Kuang's narrative, functions as a 'vessel for the dragon' (Zagrebelnaja, 2022: 305). In Chinese traditional culture, although being not a native Chinese god as he first appears in the Buddhist sutras of India, Nezha is the most influential mythical character (Xuezheng et al., 2020: 161). The Eastern Dragon is not the cruel "monster of mediaeval imagination, but the genius of strength and goodness" (Williams, 2012: 145). E. Werner, in his book *Myths and Legends of China*, calls this archetype the Third Prince No Cha and states that all circumstances of his birth are unknown. He is the third son of Li Ching and Yin Shih and he is born as "a ball of flesh" that is cut by his father sword. According to the legend, his face is strikingly white, a gold 'the horizon of Heaven and Earth' bracelet is on his right wrist, and "... he wore a pair of red silk trousers, from which proceeded rays of dazzling golden light" (Werner, 2007: 270). Being the chosen one of the Gods, he kills the third son of the Dragon King Lung Wang.

In *The Poppy War*, Nezha is represented as the second son of Yin Vashra, the governor of the Dragon Province. Nezha is Rin's course mate at the Sinegard Military Academy, and they develop an ambivalent love-hate relationship. The characters are portrayed as engaged in fierce, potentially lethal conflict. The description of Nezha's physical attributes highlights his exceptional beauty, noting his "large, almond-shaped eyes and sculpted mouth that looked good even twisted into a sneer," as well as his "porcelain white" skin and long, silky hair (Kuang, 2018: 41). Beyond these physical contrasts, the social stratification is revealed: "...expelling Nezha

would have been troublesome and politically contentious. He mattered. She did not." (Kuang, 2018: 86). The Sinegardian noble is the son of a Warlord and is opposed to Rin's position as a country girl with no social standing or connections.

No Cha in Chinese myths kills the Dragon, on the contrary, in the novel, the Dragon inhabits Nezha's body, inflicting pain while simultaneously bestowing a form of immortality and rapid wound healing. Nezha allowed the Dragon (his Shadow self) to reside within his unconscious, and he is terrified of it. As a vessel for the Dragon spirit, Nezha can create barriers from water, effectively trapping enemy missiles, and command rainfall, making the divine Phoenix God's fire ineffectual against Dragon Nezha's water-based powers.

Another difference is the use of golden bracelets as a magical means. In contrast to the mythical No Cha, aided by a golden bracelet in coping with enemies, in Kuang's novel, Nezha is fitted with golden bracelets by the Hesperians, who use them to inflict torment through electric shocks. With each movement of Nezha, the golden bracelets hum, and the skin on his wrists and ankles darkens. When he is tortured with electric discharges, he loses his connection to the Dragon spirit within.

The killing of the Dragon (the Firedrake) by the Hero in his journey is a common motif in folk narratives. I. G. Pendikova highlights that "the cultural hero triumphs over the Firedrake, signifying both his own triumph, the transcendence of his personal Shadow, and a broader cultural victory over chaos" (Pendikova, 2008: 34).

Killing the Dragon within oneself is not only a literal act, but also a metaphorical one, symbolizing the overcoming of the internal obstacles and personal transformation. This process of self-awareness and self-acceptance can be dangerous and difficult. True and lasting change requires a personal ongoing effort. As the hero of E. L. Shvarts's play 'The Dragon', Lancelot, defeating the Dragon, says "The work ahead is meticulous. Worse than

embroidery. In each of them [the inhabitants of the city], we will have to kill the dragon” (Shvarts, 2019: 97).

Focusing on the transformations of the Dragon archetype in the works of contemporary writers based on Shvarts's play, researchers note that the most frightening thing is not the monster Dragon itself, but what happens to people after many years under its rule (Gribina, 2021: 23). The impact of tyranny on the human spirit is more devastating than the initial act of oppression. The Burgomaster says of the townspeople that they have been raised to "carry anyone who cares to take the reins" (Shvarts, 2019: 56). People are not merely tools of the Dragon's will, like a knife in the hands of a criminal. The Dragon inside them has not perished and the evil has remained. Lancelot realizes that the people themselves, though physically free from the Dragon, are still burdened by its power. Citizens are shaped by its influence and by the system that allows the Dragon to survive.

The dragon-killer hero, Lancelot is ambivalent. The hero who has saved the city from the Dragon twice before, plans to use the same tactics as the despot he killed: the first (the Dragon) scarred the souls of the citizens, the second (Lancelot) aims to 're-educate' them (Shvarts, 2018: 283). Violence only gives more violence, and freedom, as it is seen in killing inner darkness, cannot exist in a society accustomed to a thousand years of slavery.

In Chinese mythology, the Dragon is the husband of the Phoenix, but Nezha (the Dragon) in Kuang's novels betrays Rin (the Phoenix). He does not even fight her face to face, but wounds her meanly, at the moment when she is dreaming of love.

As Yang for Yin, Kuang's portrayal of Nezha is considered as an archetype of Animus – an element of the female unconscious responsible for the image of a man in the psyche of a woman. In the stories of literary heroines, the positive animus finds its artistic expression in the images of a noble prince, an enchanted fiancé, the heroine's

lover, in union with whom she finds happiness. The negative influence of the animus on the female psyche finds its expression in the tragic aspects of women's stories. Such an animus is often embodied in the images of robbers, murderers, evil advisors, etc. (Turyшева, 2012: 57). Rin, who does not accept her feminine principle, fights with her Animus in the person of Nezha, and, by rejecting this hypostasis of her unconscious, she suffers wounds.

Minor characters of the trilogy, the mercenary shamans Suni and Baji, are charismatic images that also originate from Chinese mythology.

Suni is rumored to be the offspring of a human and a monkey, and he is able to communicate with Monkey God. In the text he is described as a huge man with youthful features and with an unusual amount of golden hair, walking in a strange manner: "...with an odd lope, like an ape's walk, like he'd rather be swinging through a tree instead of moving ponderously over land (Kuang, 2018: 291). Suni's prototype is the image of Sun Wukong – the Monkey King from Wu Cheng'en's novel *Journey to the West* (Cheng'en, 2013), a figure some scholars link to the Indian epic's Hanuman (Rogachev, 1984: 20). However, unlike Wu Cheng'en's Sun Wukong – a knowledgeable, powerful, and transformative ally to the Buddhist monk Tripitaka – Kuang's Suni is largely withdrawn, considered insane, and plagued by inner voices. He is happy only in the moments of battles: "That was some ancient entity, malevolent and gleeful, ecstatic to be given free rein to break men's bodies like toys" (Kuang, 2018: 308–309). In the novel, the character of Suni, the warrior, represents a specific manifestation of madness.

Baji is another precedent character, based on Zhu Bajie from Wu Cheng'en's *Journey to the West*. Like the other pilgrims, he committed crimes in a previous life and was punished by Heaven. He underwent ascetic practices in the hope of achieving salvation (Liu and Li, 2013: 1245). After drinking too much at a feast, he behaves

indecently with celestial maidens. As a result, he is exiled to Earth, where he is supposed to take the form of a newborn baby. However, he ends up in the womb of a pig by mistake. His main character traits are rudeness, laziness, lust and ignorance.

While in Wu Cheng'en's novel, Zhu Bajie is the bearer of the comic element, constantly getting into difficult situations from which he cannot get out without the help of Sun Wukong, in R. F. Kuang's narratives, Baji is 'a thickly built mercenary type with a loud booming voice. Despite his considerable girth he was somewhat handsome, in a coarse, dark sort of way...' (Kuang, 2018: 287). He is Rin's right hand, her constant interlocutor and advisor.

Both Suni and Baji are clear demonstrations of the trickster persona. The trickster figure embodies the notion of archaic, primordial tribal spirits (Szyjewski, 2020: 171). The term *trickster* is usually treated as "a collective shadow figure" and combines all the Shadow's attributes (Akhmetshin and Gorbатов, 2015: 82). The trickster as a collective shadow figure combines all the inferior traits in people. The individual and collective shadows are an integral component of the personality. According to the scholars studying the Shadow's transformation based on Jung analyses, a collective image can be formed from person's shadow with a corresponding projection on other social groups (Vavilova, 2008: 242). Suni and Baji are subordinates of Rin, and so her image begins to appear less clear as the image of the homeland's protector rises to the image of the mythological holy man – the Tang Dynasty monk Tripitaka from *Journey to the West*. The researcher of Chinese mythology, T. T. Lju, notes that "his (Tripitaka's) companions become his own human shortcomings: will and ambitions, represented by the Monkey (Sun Wukong), as well as greed, debauch, and other appetites, personified by the Pig (Zhu Bajie)" (Lju, 2022: 147). Thus, the mad Suni and the cruel Baji represent the shadow sides of the main character Rin's unconscious.

Su Daji (the Vipress), the Empress of Nikan, a shaman connected to the Mother Goddess Nüwa, serves as a good example for character's archetypal analysis. According to Chinese legends, Nüwa created people from yellow earth and "had the head of a human and the body of a snake" (Tuniyan et al., 2022: 9). This image evokes associations with Medusa Gorgon as the Empress Su Daji has the same ability of tough glance with "eyes, deep pools of black, eyes that made her (Rin) feel as she were suffocating ... but if this was drowning then Rin didn't want air, didn't need it so long as she could keep gazing into those glittering obsidian wells. She couldn't look away. She couldn't even imagine looking away" (Kuang, 2018: 180).

Female monsters (Medusa, Sphinx, Echidna, Chimera) from ancient Greece mythology are later generalized in the image of the Great Mother, and is echoed in the later descriptions of the Amazons.

Su Daji goes through many trials, being a child who grows up during the war in the environment of abuse, violence and hunger. Now, having become the ruler of Nikan, she adheres to the philosophy that 'the end justifies the means'. In the novel, Su Daji appears to the main character more as a 'terrible mother' because she hands Rin over to the Mugenese, which results in the death of Altan Trengsin, and then uses her power to resurrect the Dragon Emperor Yin Rige. Realizing that cruel and uncontrollable forces of nature have been resurrected, which will equally kill both Nikan's citizens and their foreign conquerors, Rin decides to burn the Vipress Su Daji and her mentor. This act presents an embodiment of the destructive side of the Mother archetype.

A particularly nuanced aspect of Kuang's books lies in the portrayal of the trickster archetype and the relationship to divinity. The novel treats the traditional heroic archetype in a new way. The main characters are tricksters, given their shamanistic connection to the Nikanese pantheon. The usage of opium to access the divine connections leads to characters madness and

further imprisonment in the Stone Mountains. The gods they appeal to do not obey the people with whom they communicate, the gods are prone to commit uncontrollable, destructive actions and do not think about the fate of the people inhabiting Nikan. The Nikanese gods are presented as unreliable and even destructive forces in some cases and so the single Hesperian god often wins. Unlike the traditional relationship between gods and mortals, these deities are unbound by any responsibility to their followers.

Conclusions

Thus, R. F. Kuang's *The Poppy War* can be regarded as a perfect example of contemporary mythopoeic fiction. The author integrates traditional Chinese mythology and Jungian archetypes to construct a narrative rich in symbolic resonance. As this study has demonstrated, figures such as the Dragon, the Phoenix, Sun Wukong, Zhu Bajie and Nüwa play an integral role in shaping the characters and storyline.

R. F. Kuang does not simply borrow these figures; she reimagines and reviews them through distinctly modern points.

Similar to Jung's archetypes, the images in the narrative are dynamic: they acquire specificity, power and, ultimately, awareness when confronted with empirical facts (new experiences), transforming the characters. The Shadow archetype as a kind of "prototype" turns into a motif.

The analysis shows that the role of Fang Runin's Shadow is distributed by three characters: the Phoenix, Baji and Suni. Baji and Suni die in the second part of the trilogy at the hands of the Hesperians, but the Phoenix, however, remains with Rin until her death, suggesting a more integrated form of the Shadow.

Characters' archetypal analysis reveals the complex inner world of the characters and their symbolic roles within the narrative. The heroine's main archetypes' representations are given in Table.

Table. Rin's Archetypes Manifestations
Таблица. Проявление архетипов Рин

Character	Archetypes Manifestations		Representations of Archetypal Nominations in the Trilogy
Fang Runin (Rin)	Chinese archetypal characters	The Phoenix (Shadow) / Ability to rebirth, virtue, destructive potential	Rebellious spirit, strength, the duality of power (potential for both creation and destruction) struggles with internal conflicts
		Sun Wukong/Suni Zhu Bajie/Baji (collective shadow figures)	Human beings' shortcomings: will, ambitions
	Jung's archetypes	The Shadow	Suppression of anger, desire for vengeance
		The Warriorress	Aggression, rejection of femininity
		The Animus: Altan (as Alter Ego), Nezha, Kitay	Understanding of the destiny, idealized opposite-sex relations, impulsiveness
		The Orphan Child	Loneliness, ambitions to succeed

The integration of mythological elements into the novels allows the readers not only to immerse themselves in a fascinating plot, but also to reflect on the deep psychological and cultural aspects that the author proposes. The archetypes described by Jung and his followers serve as an important tool for analyzing and interpreting a literary work, revealing universal human experiences and aspirations. Studying *The Poppy War* trilogy through the prism of mythological archetypes contributes to a deeper understanding of the text and gives new possibilities for interpreting Chinese mythology and culture in the context of modern literature.

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Olga P. Alekseeva, PhD in Philosophy, Associate Professor, Department of Foreign Language, Russian University of Transport, Russia.

Ольга Павловна Алексеева, кандидат философских наук, доцент кафедры «Иностранный язык», ФГБОУ ВО «Российский университет транспорта (МИИТ)», Россия.

Oksana I. Ivanova, PhD in Philology, Associate Professor, Head of the Department of Russian and Foreign Literature, M. K. Ammosov North-Eastern Federal University, Russia.

Оксана Иннокентьевна Иванова, кандидат филологических наук, доцент, заведующий кафедрой «Русская и зарубежная литература», ФГАОУ ВО «Северо-Восточный федеральный университет имени М.К. Аммосова», Россия.