

e-ISSN 3060-5059

DOI: 10.67227



IJTIMOYIY-GUMANITAR SOHADA ILMIY-INNOVATSION TADQIQOTLAR

ILMIY METODIK JURNAL

Scientific and Innovative Research in
Social and Humanitarian Studies

Vol. 3 • Issue 7

2026



Founded in 2024



publishscience.uz



publish_science_journal@mail.ru



PEER REVIEWED • OPEN ACCESS

TED CHIANGNING “STORY OF YOUR LIFE” ASARIDAGI ILMIY TERMINLAR, KVAZI-TERMINLAR VA MUALLIF NEOLOGIZMLARI: STRUKTUR-SEMANTIK XUSUSIYATLARI HAMDA ARRIVAL FILMIDAGI INTERSEMIOTIK TRANSFORMATSIYASI

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Annotatsiya.

Mazkur maqolada Ted Chiangning “**Story of Your Life**” ilmiy-fantastik qissasidagi ilmiy terminlar, badiiy kvazi-terminlar hamda muallif neologizmlarining struktur-semantik tashkil etilishi va ularning Denis Vilnyovning **Arrival** filmidagi intersemiotik transformatsiyasi tahlil qilinadi. Tadqiqot ixtisoslashgan leksikani ikkinchi darajali badiiy vosita sifatida emas, balki kognitiv ishonarlilikni ta'minlovchi va badiiy olamni quruvchi asosiy mexanizm sifatida talqin qiladi. Tadqiqot uchun qissadan semantik jihatdan eng muhim bo'lgan o'ttizta leksik birlik maqsadli tanlab olinib, ular filmning ingliz tilidagi dialoglari hamda audiovizual ifodasi bilan qiyosiy tahlil qilindi. Tahlil natijalari Chiang leksikasi uzluksiz tizimni tashkil etishini ko'rsatdi: haqiqiy tilshunoslik va fizika terminlari voqeani ilmiy jihatdan ishonarli bilimlar bilan bog'laydi; kvazi-terminlar o'zga sayyoralik hodisalarni shartli ravishda nomlaydi; neo-klassik va analitik usulda yaratilgan muallif neologizmlari esa mutlaqo yangi tushunchalarni kitobxon uchun kognitiv jihatdan anglash mumkin bo'lgan shaklga keltiradi. Film adaptatsiyasida tanlangan birliklarning atigi uchtasi og'zaki shaklda saqlangan, sakkiztasi qayta nomlangan yoki soddalashtirilgan, uchtasi asosan vizual yoki konseptual vositalar orqali ifodalangan, o'n oltitasi esa butunlay tushirib qoldirilgan.

Kalit so'zlar: ilmiy-fantastik terminologiya; kvazi-termin; muallif neologizmi; so'z yasalishi; *Story of Your Life*; *Arrival*; intersemiotik transformatsiya; adaptatsiya.

НАУЧНЫЕ ТЕРМИНЫ, КВАЗИТЕРМИНЫ И АВТОРСКИЕ НЕОЛОГИЗМЫ В ПРОИЗВЕДЕНИИ ТЕДА ЧАНА «STORY OF YOUR LIFE»: СТРУКТУРНО-СЕМАНТИЧЕСКИЕ ОСОБЕННОСТИ И ИНТЕРСЕМИОТИЧЕСКАЯ ТРАНСФОРМАЦИЯ В ФИЛЬМЕ «ARRIVAL»

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Аннотация.

В статье исследуются структурно-семантическая организация научных терминов, художественных квазитерминов и авторских неологизмов в научно-фантастической повести Теда Чана «**Story of Your Life**», а также их интерсемиотическая трансформация в фильме Дени Вильнёва «**Arrival**». Специализированная лексика рассматривается не как второстепенный художественный элемент, а как ключевой механизм обеспечения когнитивной достоверности и построения художественного мира. Для анализа была сформирована целевая выборка из тридцати наиболее значимых лексических единиц, которые сопоставлялись с английскими диалогами фильма и его аудиовизуальной репрезентацией. Результаты показывают, что лексическая система Теда Чана представляет собой континуум: реальные лингвистические и физические термины закрепляют повествование в сфере научного знания; квазитермины служат условными обозначениями инопланетных явлений; а прозрачные неоклассические и аналитические словообразовательные модели делают принципиально новые понятия когнитивно доступными для читателя. В киноадаптации лишь три из рассмотренных единиц сохранены в речевой форме, восемь были переименованы или упрощены, три преимущественно переданы визуальными или концептуальными средствами, а шестнадцать полностью опущены.

Ключевые слова: научно-фантастическая терминология; квазитермин; авторский неологизм; словообразование; *Story of Your Life*; *Arrival*; интерсемиотическая трансформация; адаптация.

SCIENTIFIC TERMS, QUASI-TERMS, AND AUTHORIAL NEOLOGISMS IN TED CHIANG'S "STORY OF YOUR LIFE": STRUCTURAL-SEMANTIC FEATURES AND INTERSEMIOTIC TRANSFORMATION IN ARRIVAL

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Abstract.

This article examines the structural-semantic organization of scientific terms, fictional quasi-terms, and authorial lexical innovations in Ted Chiang's science-fiction novella "Story of Your Life" and traces their intersemiotic transformation in Denis Villeneuve's film *arrival*. The study treats specialized vocabulary not as a peripheral ornament but as a principal mechanism of cognitive plausibility and fictional world-building. A purposive analytical sample of thirty high-salience lexical units was compiled from the novella and compared with the film's English dialogue and audiovisual representation. The analysis shows that Chiang's lexicon forms a continuum: real linguistic and physical terminology anchors the narrative in recognizable knowledge; quasi-terms provisionally name alien phenomena; and transparent neo-classical or analytic formations make radically unfamiliar concepts cognitively accessible. In the film, only three sampled units are verbally retained, eight are relabelled or simplified, three are primarily transferred through visual or conceptual means, and sixteen are omitted.

Keywords: science-fiction terminology; quasi-term; authorial neologism; word formation; *Story of Your Life*; *Arrival*; intersemiotic transformation; adaptation.

Introduction. Scientific vocabulary performs a distinctive double function in science fiction. It refers to recognized bodies of knowledge, but it also teaches readers how to interpret phenomena that do not exist outside the fictional world. In a technically dense work, the lexicon therefore participates in narration, characterization, epistemology, and world-building simultaneously. Terms may authenticate a speculative premise, delimit a character's expertise, delay comprehension, or create the impression that a fictional science possesses an internally coherent nomenclature. The language of science fiction consequently cannot be described through a simple opposition between "real terminology" and "invented words." It is more accurately represented as a continuum extending from established scientific terms through provisional quasi-terms to authorial neologisms and semantic innovations.

Ted Chiang's *Story of Your Life* is an especially productive text for examining this continuum. The novella places a linguist at the center of first contact and develops its speculative premise through field linguistics, graphemics, physics, and the philosophy of time. Its technical vocabulary includes established units such as *phoneme*, *case marker*, *free word order*, *center-embedding*, *logogram*, *semasiographic writing*, *Fermat's principle*, *calculus of variations*, and *teleology*. At the same time, the narrative constructs a fictional research metalanguage through *looking glass*, *Heptapod A*, *Heptapod B*, *two-dimensional grammar*, and *gift exchange*. Finally, forms such as *heptapod*, *semagram*, *rocky-orbiter*, and the bracketed *flutter* notation demonstrate different modes of authorial lexical innovation. The novella was later adapted as *Arrival*, a film that retains the linguistic core of Chiang's story but radically redistributes its technical exposition across dialogue, montage, graphic design, sound, and visual effects.

Literature Review. Science-fiction theory has long connected the genre's plausibility to the interaction between cognition and estrangement. Suvin (1979) describes science fiction in terms of cognitive estrangement: the fictional *novum* departs from empirical reality, yet it is presented as systematically intelligible. Lexical choice is central to this process because readers encounter the *novum* through names, definitions, taxonomies, and explanatory discourse. Stockwell (2000) similarly treats science-fiction reading as a process of constructing and revising cognitive schemas, while Csicsery-Ronay (2008) identifies neology as one of the genre's defining aesthetic practices. From this perspective, neologisms are not decorative curiosities; they are interfaces through which readers gain provisional access to a new world.

Terminology studies provide a complementary framework. Cabré (1999) emphasizes that terms are lexical units whose specialized status emerges in communicative situations rather than from form alone. Temmerman (2000) further argues that specialized concepts are often prototype-based, dynamic, and context-sensitive. These observations are useful for science fiction, where a familiar word may acquire a highly specialized fictional referent. In this article, a quasi-term is operationally defined as a lexical unit that imitates the precision and discourse function of terminology but designates a provisional, fictional, or not-yet-understood entity. *Looking glass* and *Heptapod B*, for example, function as research labels before the fictional researchers fully understand their referents. *Authorial neologism* is used more broadly to refer to a newly formed, newly combined, or newly specialized unit whose lexical identity is substantially shaped by the author's fictional system.

Word-formation theory helps explain why Chiang's innovations remain readable. Bauer (1983) and Plag (2003) show that English word formation relies on productive compounding, derivation, conversion, and neo-classical combining forms. Chiang's *heptapod* is structurally transparent because *hepta-* and *-pod* activate learned Greek elements; *semagram* resembles established formations such as *phonogram* and *logogram*; and *rocky-orbiter* packages an alien gloss through ordinary compounding. The unfamiliarity of the referent is therefore balanced by the familiarity of the

morphological process.

Adaptation introduces a different semiotic economy. Jakobson's concept of intersemiotic translation describes the interpretation of verbal signs by means of nonverbal sign systems (Jakobson, 1959/2000). Hutcheon and O'Flynn (2013) understand adaptation as both a product and a process, emphasizing that media do not simply carry identical content but reorganize it according to their affordances.

Materials and Methods. The primary literary material is Ted Chiang's *Story of Your Life*, first published in 1998 and subsequently collected in *Stories of Your Life and Others*. The audiovisual material is Denis Villeneuve's *Arrival* (2016), written for the screen by Eric Heisserer. The film dialogue was checked against the English subtitle transcript, while visual and graphic transformations were assessed through repeated viewings of the relevant sequences. The analysis uses a purposive rather than an exhaustive sample: thirty high-salience lexical units were selected because they recur, name central scientific or fictional concepts, organize the narrative's research discourse, or undergo a clearly observable transformation in the film.

Each unit was coded on four dimensions: (1) ontological status, (2) structural model, (3) semantic-discursive function, and (4) primary adaptation outcome.

Table 1. Operational categories and their representation in the 30-item analytical sample

Category	Operational definition	Representative examples	n (%)
Established scientific terms	Recognized units from linguistics or physics used in their disciplinary sense	vocal tract; phoneme; case marker; free word order; semasiographic; Fermat's principle	16 (53.3%)
Fictional quasi-terms	Provisional or fictional labels that imitate terminological precision	looking glass; Heptapod A; Heptapod B; two-dimensional grammar; gift exchange	7 (23.3%)
Authorial lexical innovations	Coined, recombined, symbolically notated, or semantically refunctionalized units	heptapod; semagram; [flutter1]; rocky-orbiter; inequality-of-size	7 (23.3%)

The sample confirms that the novella's specialized lexicon is dominated by established scientific terminology: sixteen of the thirty units (53.3%) belong to recognizable linguistic or physical terminology. Seven units (23.3%) are quasi-terms, and seven (23.3%) are authorial lexical innovations. This distribution is stylistically significant. Chiang does not construct the alien world through unrestricted lexical invention. Instead, he embeds a relatively small set of innovations within a dense matrix of real scientific vocabulary. The established terminology supplies epistemic discipline, while the invented units identify points at which ordinary knowledge becomes insufficient.

Established terms perform at least three functions. First, they authenticate professional practice: *vocal tract*, *larynx*, *auditory system*, *phoneme*, *sound spectrograph*, *field linguistics*, *grapheme*, and *case marker* establish Louise Banks as a specialist whose decisions follow recognizable procedures. Second, they convert alien contact into an analyzable problem. *Free word order*, *center-embedding*, *semasiographic*, and *nonsegmental grapheme* do not merely describe language; they make the alien system comparable to human linguistic categories. Third, physical terms such as *Fermat's principle*, *calculus of variations*, and *teleology* link grammar to a broader model of time and causation. Scientific terminology therefore carries thematic weight: the vocabulary of analysis becomes the vocabulary of determinism.

Quasi-terms occupy an intermediate zone between discovery and definition. *Looking glass* names an alien communication device through a familiar cultural expression, yet the label is explicitly provisional. *Heptapod A* and *Heptapod B* imitate scientific nomenclature: the lettered distinction appears neutral and technical, but it conceals radically different ontologies of speech and writing. *Two-dimensional grammar* and *simultaneous mode of consciousness* compress unfamiliar structures into interpretable English phrases. *Gift exchange* turns an unresolved interspecies transaction into a diplomatic term. The semantic authority of these expressions is therefore performative rather than fully referential: the labels help the researchers work before the referents are completely understood.

Authorial innovations are comparatively few, but they occupy the conceptual center of the narrative. *Heptapod* is a neo-classical formation whose internal structure makes the alien body immediately interpretable: *hepta-* activates the meaning "seven," and *-pod* evokes "foot" or "limb." *Semagram* is introduced as a correction to *logogram* because the graphic sign does not correspond to a spoken word. The bracketed [flutter1]–[flutter3] notation simulates a field linguist's temporary transcription when the sound cannot yet be phonologically segmented. *Rocky-orbiter*, *inequality-of-size*, and *process create-endpoint inclusive-we* imitate literal interlinear glossing and display the mismatch between human syntax and alien conceptual packaging. The marked metaphor *glottographic straitjacket*, finally, evaluates human writing as unnecessarily constrained by speech. These innovations are structurally transparent but semantically estranging: readers can parse the forms while remaining uncertain about the alien concepts.

Table 2. Principal structural-semantic patterns of specialized vocabulary

Pattern	Example	Structure	Primary semantic function
Neo-classical compounding	heptapod	hepta- + -pod	Names an alien body through a learned, transparent formation
Terminological redefinition	semagram	sema- + -gram	Corrects the speech-centered implications of logogram
Alphabetic	Heptapod A /	proper label +	Separates alien speech from alien

nomenclature	Heptapod B	letter	writing
Semantic specialization	looking glass	ordinary phrase → technical label	Provisionally names the alien communication device
Multiword terminology	two-dimensional grammar	modifier + head	Condenses a spatially organized grammatical system
Symbolic placeholder	[flutter1]–[flutter3]	bracketed acoustic notation	Turns unsegmented sound into analyzable data
Analytic gloss-compound	inequality-of-size; rocky-orbiter	hyphenated conceptual packaging	Imitates literal translation from alien speech
Evaluative metaphor	glottographic straitjacket	technical adjective + metaphorical noun	Critiques writing constrained by sequential speech

The structural data indicate a preference for analytical and compositional word formation. Multiword scientific terms, such as *sound spectrograph*, *free word order*, and *calculus of variations*, draw authority from established disciplinary phraseology. Neo-classical compounding produces *heptapod*, while the Greek-derived suffix *-gram* creates a family relationship among *phonogram*, *logogram*, and *semagram*. Alphabetic labelling in *Heptapod A* and *Heptapod B* mimics taxonomic neutrality. Hyphenated compounds such as *rocky-orbiter* and *inequality-of-size* reproduce the compression of an interlinear gloss rather than ordinary literary prose. Symbolic placeholders such as [flutter1] transform an uninterpreted acoustic event into a manipulable research object.

A second pattern is semantic refunctionalization. *Looking glass* is not a newly formed word; rather, the familiar expression is specialized as the name of an alien communication interface. *Gift exchange* similarly imports an anthropological-diplomatic expression into the context of interspecies contact. *Glottographic straitjacket* transforms a technical adjective into a critical metaphor. Such refunctionalization is particularly economical because it gives readers immediate semantic footholds while allowing the fictional context to reshape the term.

Arrival reduces the novella's metalinguistic density and replaces it with a smaller lexical core supported by strong visual design. Of the thirty source units, three are primarily retained verbally, eight are relabelled or simplified, three are mainly transferred through visual or conceptual means, and sixteen are omitted. The largest category is omission (53.3%), but omission should not be equated with thematic loss. The film removes detailed explanations of the vocal tract, larynx, case marking, center-embedding, nonsegmental graphemes, Fermat's principle, and the calculus of variations. These deletions shorten the research process and shift the explanatory burden from disciplinary detail to montage, dialogue, and visual pattern.

The most revealing lexical change is the replacement of *semagram* with *logogram*. In the novella, Louise rejects *logogram* as a misnomer and proposes *semagram* because the signs encode meaning without corresponding to spoken words. The film retains the definition *semasiographic* but uses *logogram* as the more accessible label. The result is a terminological compromise: the semantic principle is preserved, while the less familiar metalinguistic innovation is removed. Similarly, *Heptapod A* and *Heptapod B* are largely collapsed into the more general concept of the *heptapod language*, and the novella's two-dimensional grammar becomes the film's concise *nonlinear orthography*. The latter is not simply shorter; it is audiovisually efficient because the circular signs immediately demonstrate the absence of a forward or backward direction.

The novella's *looking glasses* are relabelled as *shells* in the film. The new term aligns the objects with their monumental, enclosed visual form and with the film's military vocabulary of vessels and sites. The narrative function of *gift exchange* is also reconfigured as the *weapon/tool/gift* ambiguity, producing a geopolitical crisis that does not structure the novella in the same way. Film-specific additions such as the *Sapir-Whorf hypothesis* explicitly name the relationship between language and thought, while Abbott and Costello replace Flapper and Raspberry with a culturally recognizable comic pairing. These additions make the conceptual conflict immediately legible to a broad audience.

Visual transposition is most important in the representation of Heptapod writing. Chiang explains orientation, stroke curvature, thickness, radical size, nonsegmentation, and simultaneous composition through extended prose. *Arrival* converts this description into circular ink forms, analytic interfaces, repeated close-ups, and a montage of increasing competence. Production accounts indicate that the design team developed an internally differentiated visual vocabulary rather than relying on arbitrary decoration. The logograms consequently become intersemiotic equivalents: they do not reproduce every linguistic property described in the novella, but they materialize simultaneity, nonlinearity, and semantic holism in a form that cinema can present instantaneously.

Table 3. Representative lexical transformations from the novella to the film

Source-text unit	Film form	Primary outcome	Interpretive consequence
heptapod	heptapod	Verbal retention	Neo-classical alien taxon remains immediately interpretable
semasiographic	semasiographic	Verbal retention	Core semantic principle of the writing system is preserved

logogram	logogram	Verbal retention + visualization	The term is reinforced by circular graphic forms
semagram	logogram	Relabelling / simplification	Chiang's terminological correction is removed for accessibility
looking glass	shell	Semantic relabelling	Optical-interface metaphor becomes a visual-vessel metaphor
Heptapod A / Heptapod B	heptapod language / logograms	Nomenclatural compression	The two-language distinction is reduced
two-dimensional grammar	nonlinear orthography	Conceptual relabelling	Spatial grammar becomes a concise film term
simultaneous mode of consciousness	nonlinear perception of time	Conceptual transposition	Abstract explanation is distributed across dialogue and editing
gift exchange	weapon / tool / gift	Pragmatic rewriting	Diplomatic exchange becomes a geopolitical ambiguity
sound spectrograph	analytic screens and interfaces	Visual transposition	Instrumental analysis is shown rather than explained
Fermat's principle	—	Omission	The physics-based route to teleology is removed
calculus of variations	—	Omission	Technical exposition is excluded for pacing
center-embedding	—	Omission	Detailed grammatical typology is not verbalized
[flutter1]-[flutter3]	—	Omission	Provisional acoustic notation is replaced by staged interaction
rocky-orbiter / inequality-of-size	—	Omission	Alien gloss structures are not reproduced verbally

Table 4. Film-specific lexical additions and their adaptive functions

Film-specific unit	Lexical-semantic function	Narrative / pragmatic function
shell	Names the alien craft/site through a visually motivated metaphor	Replaces looking glass and aligns with the monumental vessel design
nonlinear orthography	Condenses spatial, nonsequential writing into a memorable technical label	Makes the written system explainable in brief voice-over
Sapir-Whorf hypothesis	Explicitly names the relation between language and thought	Substitutes a linguistic-relativity route for the novella's physics-heavy explanation
weapon / tool / gift	Creates a contested semantic field around alien intention	Generates geopolitical suspense and foregrounds translation uncertainty
Abbott and Costello	Provides culturally recognizable nicknames for the two aliens	Replaces Flapper and Raspberry with a comic intertext accessible to film dialogue

Results. The descriptive findings can be summarized in five points. First, established scientific terminology constitutes the largest lexical class in the selected source-text sample, confirming that the novella's cognitive plausibility depends more on the disciplined reuse of real knowledge than on extensive lexical invention. Second, quasi-terms mediate between observation and understanding: they allow the fictional researchers to refer to entities before their scientific status is settled. Third, authorial innovations are morphologically transparent. Chiang favors learned combining forms, compounding, alphabetic labels, and analytic glosses rather than opaque coinages.

Fourth, lexical adaptation is selective. The film verbally preserves only the most communicatively productive core—*heptapod*, *logogram*, and *semasiographic*—while technical detail is often simplified or omitted. Fifth, the film compensates through new accessible labels and visual design. *Nonlinear orthography*, the *Sapir-Whorf hypothesis*, *shell*, and the *weapon/tool/gift* cluster reorganize the conceptual material for cinematic pacing. The circular logograms carry a large share of the semantic work previously performed by linguistic exposition.

Discussion. The results support the view of science-fiction terminology as a graded system rather than a set of

mutually isolated categories. In the novella, scientific terms, quasi-terms, and neologisms continually interact. *Semagram* looks like a term, behaves like a neologism, and is introduced through explicit terminological argument. *Looking glass* is an ordinary expression, a semantic neologism, and a quasi-term simultaneously. *Heptapod* is a transparent classical compound that rapidly becomes a taxonomic label. A rigid binary distinction between “real” and “invented” vocabulary would therefore obscure the text’s most important stylistic mechanism: the gradual conversion of unfamiliar experience into disciplinary language.

The high omission rate in the film reflects medium-specific economy rather than simple simplification. Literary prose can suspend the plot for metalinguistic and physical explanation, whereas film must coordinate dialogue with duration, performance, and visual attention. *Arrival* responds by concentrating technical discourse into a few memorable formulations and allowing the audience to infer complexity from screens, diagrams, logograms, and editing. This confirms Hutcheon and O’Flynn’s argument that adaptation is a creative transposition governed by medium-specific affordances rather than a secondary copy.

The shift from Fermat’s principle and teleology to the Sapir–Whorf hypothesis is especially consequential. Chiang’s novella links alien writing to variational physics and a purposive interpretation of natural law. The film foregrounds linguistic relativity and the cognitive effects of immersion. Both versions connect language to temporality, but they construct that connection through different disciplinary pathways. The adaptation therefore performs conceptual relabelling at the macro level: physics loses explanatory prominence, while linguistics becomes the explicit causal bridge between script and consciousness.

Conclusion

Ted Chiang’s *Story of Your Life* constructs scientific credibility and cognitive estrangement through a carefully graded lexical system. Established linguistic and physical terminology supplies methodological realism; quasi-terms register provisional knowledge; and authorial innovations name phenomena that exceed existing categories. Structurally, the innovations are mostly transparent, relying on classical combining forms, compounding, analytic glosses, symbolic notation, and semantic specialization. This transparency enables readers to process unfamiliar concepts without diminishing their sense of alienness.

Arrival transforms this lexical architecture according to cinematic priorities. The film retains a minimal terminological core, replaces several source labels with more accessible expressions, omits dense grammatical and physical exposition, and redistributes meaning across logogram design, montage, sound, and narrative structure. The adaptation’s achievement lies not in reproducing every term but in creating an audiovisual system that performs comparable conceptual work. Scientific vocabulary thus moves from verbal explanation to multimodal organization, demonstrating that intersemiotic adaptation is a process of semantic redistribution as much as lexical reduction.

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