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GENERAL METAPHOR TYPOLOGY IN RESEARCH ARTICLE INTRODUCTIONS IN THE FIELD OF ECONOMICS

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Metaphors serve as a key rhetorical device that engages readers while clarifying intricate economic ideas. Economic writing, particularly in Introductions, is often marked by a high frequency of metaphorical language, as authors seek to situate their research within the broader academic conversation. This paper aims to enhance understanding of conceptual metaphor typology in economics by analyzing a selection of articles from high-impact journals. The study employs a methodology that categorizes metaphors into ontological, structural, and orientational types. The findings align with existing research in conceptual metaphor analysis within scientific discourse.

Key words: metaphor, rhetorical device, economic articles, discourse

1. Introduction: Metaphor as a Cognitive and Rhetorical Imperative

The pervasive assumption that specialized academic discourse, particularly within disciplines characterized by quantitative methodologies like economics, maintains an exclusive commitment to literal and objective language has been comprehensively challenged by decades of research in cognitive linguistics and genre analysis. This study is fundamentally rooted in the tenets of Conceptual Metaphor Theory (CMT), which posits that metaphor is not merely an optional stylistic embellishment but rather a fundamental, systematic, and often unconscious cognitive mechanism employed to conceptualize and reason about abstract and inherently complex domains (Lakoff & Johnson 1980). The economic system, with its non-physical entities like utility, risk, and policy, presents a prime example of an abstract domain necessitating metaphorical structuring (Henderson 1994).

The non-perceptual, complex nature of economic thought relies heavily on systematic mappings from concrete, embodied experience to be made tractable for formal analysis.

The Introduction section of the *research article* (RA) is the crucial rhetorical space where the author must strategically establish disciplinary alignment, assert scientific novelty, and justify the research's expenditure of resources. This persuasive process is rigorously articulated through a sequence of communicative goals, formalized by genre-analytical models like Swales' CARS (Creating A Research Space) model (Swales 1990, Swales & Feak 2004). Further to Swales' research, Bhatia (1993) emphasized that genres are defined by their communicative purpose, and the RA Introduction's purpose is intrinsically persuasive: to convince the reader and reviewers of the study's merit and originality. Additionally, structural models across specialized domains, such as Nwogu's (1997) move structure in health sciences, confirm the cross-disciplinary necessity of this structured argumentative trajectory. The present investigation explores the intricate, mutually reinforcing relationship between the rhetorical moves demanded by this academic genre and the underlying general conceptual metaphor typologies activated to execute these moves effectively and persuasively.

The study is interdisciplinary, residing at the nexus of cognitive linguistics, academic rhetoric, and discourse analysis. The primary objective is to systematically quantify, categorize, and functionally analyse the distribution of the three major metaphor typologies–*ontological, structural*, and *orientational*–in the Introductions of English-language economics RAs. By linking the frequency and type of metaphor to the specific rhetorical function of each move, the study aims to demonstrate metaphor's non-trivial role in facilitating both conceptual clarity and argumentative persuasion within the economics discipline. This research argues that metaphor serves as the cognitive cement for the genre, rendering abstract economic concepts tractable and ensuring the argumentative flow required for academic legitimation.

2. Theoretical Background: Cognitive and Genre Frameworks

2.1. Conceptual Metaphor Theory (CMT), Embodiment, and Conceptual Blending

CMT established that abstract concepts are systematically mapped onto concrete, typically embodied concepts, driven by correlations in experience (Lakoff 1993, Kövecses 2002). The conventionalized nature of these mappings governs specialized discourse. The understanding that

abstract knowledge is rooted in physical interaction–the *embodied cognition thesis*–is central to CMT (Gibbs 2017). Yet, metaphors are not static mappings but context-sensitive phenomena. It is noteworthy that while the body is crucial, it is only one of several contexts shaping metaphor creation (Kövecses 2015).

A critical extension of CMT addresses the neurological grounding of metaphor. *Primary metaphors* (Grady 1997) emerge from the simultaneous co-activation of distinct neural circuits during early, recurring sensorimotor experiences (e.g., MORE IS UP). This process is governed by Hebb's principle, or "neurons that fire together, wire together," which posits that if Neuron A and Neuron B are repeatedly activated simultaneously, the synaptic connection between them strengthens (Feldman 2006). This Hebb-based mechanism explains how the arbitrary correlation between two experiential domains (e.g., physical weight and conceptual difficulty) becomes a foundational, automatic cognitive mapping (DIFFICULTY IS HEAVINESS). Such primary mappings form the neural foundation for the three general typologies: ontological, structural, and orientational.

Furthermore, complex metaphor usage often involves *conceptual blending* (Fauconnier & Turner 2002). This mechanism is vital for generating the novel and complex figurative expressions necessary for academic creativity. For instance, the complex metaphor BRIDGING THE GAP blends the knowledge of *research gap* (an intellectual problem) with *bridge construction* (a physical solution to a spatial obstacle) to produce the emergent meaning of methodological connection.

The analysis relies on the general typology (Lakoff & Johnson 1980):

1. *Ontological metaphors* (reification): Essential for reification, allowing abstract entities (e.g., economic volatility) to be viewed as a concrete, bounded physical object, substance, or container.
2. *Structural metaphors*: Transfer the complete internal structure (logic, hierarchy, dynamics) from a source (e.g., ARCHITECTURE) to an abstract target (e.g., THEORY).
3. *Orientational metaphors*: Derived from basic embodied experience (UP/DOWN), they map spatial orientation onto evaluation, quantity, or status.

2.2. Genre Analysis: The Rhetoric of the Research Article Introduction

The RA Introduction is the primary mechanism for establishing the academic genre, driven by the communicative purpose of claiming a legitimate space for new knowledge (Swales 1990). The CARS model provides the structural blueprint, describing the obligatory sequence of

moves (Swales & Feak 2004). The corpus analysis conducted in this study revealed an additional rhetorical move beyond the original three proposed by Swales (1990):

- Move 1 (establishing a territory): Defines relevance and broad context (aligned with Nwogu's (1997) *stating the goal*).
- Move 2 (establishing a niche): Identifies the gap, limitation, or problem–the critique. This is rhetorically sensitive, often using Politeness Theory to soften criticism (Brown & Levinson 1987).
- Move 3 (occupying the niche): States the paper's aims, method, and contribution and aligns with Nwogu's highlighting the importance of the research.
- Move 4 (significance of the research paper): Outlines the structure and implications.

Metaphorical language is the structural cement of these moves. Ontological and orientational metaphors create the urgency for Move 2 by spatially or physically embodying the problem, while structural metaphors frame the contribution in Move 3 as a legitimate, sequential progression.

3. Methodology

3.1. Corpus Segmentation and Identification Procedure

The empirical data for this study was collected from a corpus of 47 peer-reviewed research articles (RAs) from high-impact English-language economics journals. The analytical scope was strictly limited to the Introduction sections (the content of the four obligatory rhetorical moves), which yielded a total word count of 59,500 words for the metaphor identification procedure.

Metaphor identification utilized the systematic procedure of MIPVU (Metaphor Identification Procedure Vrije Universiteit) (Steen et al. 2010). A lexical unit was marked as a metaphor token only if its contextual meaning was systematically relatable to, yet distinct from, its basic (literal) meaning. A maximalist counting approach was employed, cataloguing all 13,568 metaphor tokens, including highly conventionalized expressions, ensuring comprehensive data capture across the general typologies.

3.2. Statistical Findings Overview

The rigorous analysis of the 59,500-word corpus resulted in a high metaphor-word ratio of 22.80%. The distribution across the general typologies is highly concentrated, confirming the centrality of object and

structure in economic conceptualization. The overall distribution across the general typologies is presented in Table 1 below:

Table 1. *Overall distribution across the general typologies*

Metaphor Type	Token Count	Percentage Share
Ontological Metaphors	7,146	52.6%
Structural Metaphors	5,808	42.8%
Orientational Metaphors	614	4.5%
Overall	13568	–

Table 2 shows a functional differentiation in metaphor deployment across the rhetorical structure of the Introduction.

Table 2. *Functional Distribution of Metaphor Types Across Rhetorical Moves*

Rhetorical Move	Primary Function	Dominant Metaphor Type	Key Rhetorical Role
Move 1 (Territory)	Scope definition	Ontological (54.7%)	Quantification of existing literature; bounding the field.
Move 2 (Niche/Gap)	Critique & urgency	Structural (50.9%)	Modeling the critique as conflict or structural flaw.
Move 3 (Occupying Niche)	Contribution & method	Ontological (53.9%)	Objectifying the study's findings; framing research as action.
Move 4 (Significance)	Implications & future path	Ontological (52.6%)	Objectifying and evaluating the paper’s impact.

As can be seen from table 2, while ontological metaphors dominate in absolute count across all moves, structural metaphors indicate their highest relative density in Move 2, emphasizing their role in modeling conflict and critique.

4. Analysis of Dominant Metaphor Typologies and Rhetorical Function

4.1. Ontological Metaphors: Causal Accountability

The dominance of *ontological metaphors* is the direct cognitive strategy to deal with the inherent abstractness of economic concepts. Reification allows these non-physical concepts to be quantified, bounded, and manipulated within a formal, analytical framework.

- ABSTRACT CONCEPTS ARE SUBSTANCES/CONTAINERS (Move 1): This system is critical for defining the discursive space and scope. The CONTAINER scheme is ubiquitous in Move 1 for quantifying the literature: “a vast field of research”, “this concept is embedded in existing theory”, “this analysis falls within the scope of our study”.
- ECONOMIC PROCESSES ARE AGENTS/PERSONS (Move 2/3): Personification is the most frequent ontological sub-type, critical for assigning causal agency and accountability, essential for setting up the critique in Move 2. This is realized by non-human subjects acting as agents. Examples: "The model fails to account for X", "Inflation creeps up", "The market reacted strongly to the news". The linguistic realization often involves high-frequency, seemingly neutral verbs like *show*, *indicate*, and *suggest*, where the abstract subject is tacitly personified to perform a communicative act. The most frequent personified agent is LITERATURE (e.g., Literature shows that...), serving to shift argumentative responsibility away from the human author.

4.2. Structural Metaphors: Legitimacy, Continuity, and Teleological Progression

Structural metaphors are strategically deployed to manage the rhetorical positioning of the research contribution, particularly in Move 3 (occupying the niche). They transform the abstract activity of knowledge creation into recognizable, embodied human actions (building, traveling).

- THEORY/ARGUMENT IS A BUILDING/STRUCTURE: This system maps the stability and hierarchy of architecture onto the abstract field of knowledge.
  - Move 3 (legitimation): The work is framed as continuous and supportive: "Our findings build upon the existing foundations of X", "The structural weakness needs reinforcement".

- RESEARCH IS A JOURNEY/MOVEMENT: This system transforms the research process into a logical, purposeful search, managing the reader's expectations of disciplinary advancement. The structural isomorphism involves sub-mappings (Lakoff & Johnson 1980):
  - The research activity is movement: e.g., "The paper takes a step forward."
  - The research aims are destinations: e.g., "We aim to reach a conclusion."
  - The methodology is a path/vehicle: e.g., "We follow a new path for analysis."
  - Difficulties are obstacles: e.g., "The model suffers from constraints."
  - Move 3 (teleological progression): The contribution is positioned as inevitable progress toward a predefined goal: "This paper pioneers a new path for analysis", "We bridge the gap using new methods", "The analysis takes the next logical step forward".

4.3. Orientational Metaphors: Evaluation and Rhetorical Urgency

Orientational metaphors provide the necessary evaluative framing for the persuasive moves, leveraging the deeply embodied correlation between spatial and emotional/quantitative states.

- GOOD IS UP / BAD IS DOWN (evaluation): This dominant mapping assigns immediate value to economic states, primarily used in Move 2 (problem highlighting). Examples: "A fall in consumer confidence", "Output tumbled rapidly", "Interest rates are low". This transforms statistical data into a visceral, unstable reality, strengthening the argumentative force for the niche.
- Rhetorical function: These metaphors serve as powerful cognitive shortcuts for conveying the significance of a finding, accelerating the reader's engagement with the problem defined in Move 2 (Charteris-Black 2004).

5. Discussion: The Cognitive-Rhetorical Synthesis in Economics

The high metaphor density (22.80%) confirms that figurative language is a cognitive necessity in the economics RA genre. The typology distribution directly aligns with the core rhetorical challenges articulated by the CARS model and genre theory.

5.1. Metaphor Conventionality, Entrenchment, and Cognitive Fluency

The high prevalence of conventionalized metaphors is crucial for processing efficiency within the expert community. Conventionalization minimizes the cognitive load required to understand the abstract concept, allowing the specialist reader to focus immediate attention on the novel data and methodology presented. This cognitive fluency is an essential requirement for the timely dissemination of knowledge, especially given the rapid pace of economic research. The conventionalized nature of metaphors like RESEARCH IS A JOURNEY ensures that the sequential move structure required by the genre (Nwogu 1997) is automatically understood. Furthermore, this conventionalization leads to entrenchment–the degree to which a symbolic unit becomes a 'routine operation' in the thought process. The highly entrenched nature of ontological personification in economics implies that the perception of non-human entities as active agents is now cognitively automatic, reinforcing the difficulty in adopting alternative, non-agentive conceptual models.

5.2. Ideological, Epistemological, and Ethical Implications

The study of metaphor in economics transcends mere linguistic cataloguing; it touches upon the epistemological foundations and ideological biases of the discipline.

The sheer dominance of the ontological typology (52.6%) reflects the discipline's epistemological drive to objectify every concept for mathematical manipulation. This epistemological reliance on reification reflects the discipline's attempt to treat non-physical entities as quantifiable variables, bringing them into the realm of statistical modeling.

However, the systematic use of personification to assign agency to the market, policy, or model can inadvertently conceal human responsibility or political assumptions. By framing the market as an autonomous agent that reacts or suffers, the discourse often obscures the political or institutional decisions that shape economic outcomes (Lakoff 1996). This framing choice is not neutral; it structures both cognitive understanding and normative judgment, often reinforcing neo-liberal or rational-actor models of the economy. The ethical imperative arises from the fact that these metaphorical choices can lead to a false sense of determinism or naturalization of current economic systems (Fairclough 2005).

5.3. Disciplinary Constraints and Metaphor Choice

The highly quantitative nature of modern economics imposes specific constraints on metaphor usage. The discipline favors metaphors that

emphasize objectivity, stability, and control. This preference explains the dominance of ontological and structural types, which inherently convey these qualities (e.g., the stability of a BUILDING, the measurability of a CONTAINER). Conversely, subjective or emotionally charged source domains are largely suppressed, focusing instead on objective, physical relations (Kövecses 2015). The rhetorical requirement to present empirical data in Move 2 and Move 4 is directly supported by the ontological and orientational frames, which transform abstract numbers into concrete spatial evaluations (UP/DOWN) that resonate with the embodied experience of success or failure. The functional congruence between the quantitative result (a number) and its metaphorical framing (UP/DOWN) transforms raw data into a rhetorically persuasive claim.

5.4. Metaphorical Congruence Across Genres: The Rhetorical Strategy of Moves

The congruence between the metaphorical typology found in economics and the rhetorical moves of the RA Introduction aligns with similar findings across diverse specialized discourses (Mirowski 1989, Henderson 1994). This reinforces the concept that the cognitive need to structure abstract knowledge (CMT) is the foundational force dictating the rhetorical means (genre analysis) by which knowledge claims are presented and legitimized across the academic sphere. An author's successful navigation of the genre–especially the transition from Move 2 (critique) to Move 3 (contribution)–is dependent on the seamless switch between metaphors that highlight deficiency (e.g., structural weakness) and those that promise progress (e.g., next step forward).

5.5. Pedagogical Implications for EAP/ESP

The identification and typology of these functional metaphors hold significant pedagogical value for English for Academic Purposes (EAP) and English for Specific Purposes (ESP) instruction. Explicit training in recognizing the rhetorical function of ontological personification (e.g., distinguishing when "the model" is acting agentively versus being acted upon) and structural metaphors (e.g., using "JOURNEY" terminology to structure the methodology) can significantly enhance the academic literacy and rhetorical competence of non-native English speakers in economics. Metaphor awareness bridges the gap between basic language skills and the complex disciplinary reasoning required by the genre. Furthermore, understanding the precise lexical realisations of these highly conventionalized metaphors (e.g., the specific verbs that realize personification) provides

concrete targets for instruction, leading to more coherent and rhetorically effective writing.

6. Conclusion and Future Directions

This study has systematically quantified and functionally analyzed the general metaphor typology in the introductory sections of English economics research articles. The high metaphor density (22.80%) and the highly skewed distribution toward ontological (52.6%) and structural (42.8%) metaphors unequivocally establish that the economic discourse is fundamentally structured by metaphors of *object, structure*, and *movement*.

The findings confirm metaphor's non-trivial dual function: cognitively, it renders the abstract domain tractable and manipulable; rhetorically, it provides the essential tools for executing the persuasive moves required by the academic genre, as formalized by Swales (1990) and Bhatia (1997). The strategic activation of ontological metaphors facilitates complexity management and causal accountability, while Structural metaphors ensure rhetorical alignment with disciplinary norms of progress and legitimacy, satisfying the communicative purpose of the genre. The specific examples cited from the monograph–such as THEORY IS A BUILDING and RESEARCH IS A JOURNEY–demonstrate the precise lexical and conceptual mechanisms by which this rhetorical work is achieved.

Future research should prioritize a fine-grained contrastive analysis of intentional (novel) metaphors versus conventional metaphors across different sections (e.g., Results and Discussion) to track the entire life cycle of metaphorical conceptualization within the genre. Furthermore, a cross-cultural analysis of this typology across economics articles published in non-English languages is necessary to determine the degree of cultural and linguistic specificity in the conceptualization of economic reality (Kövecses 2010). Methodological advancements should include psycholinguistic validation studies (e.g., eye-tracking) to empirically measure how metaphor-rich moves affect comprehension and inference, thereby solidifying the link between cognitive theory and textual performance.

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