Words that matter: A cross-disciplinary investigation of importance markers in 3MT presentations

Qian Wang, Yanhua Liu, Guangwei Hu

Abstract

Importance markers are essential rhetorical tools for justifying claims, engaging audiences, and highlighting research contributions. However, their deployment in interdisciplinary, high-stakes genres such as the Three Minute Thesis (3MT) remains underexplored. Grounded in frame semantics, this study introduces the Importance Frame, a conceptual framework designed to capture the cognitive dimensions of importance markers. It comprises five key frame elements, namely Factor, Explanation, Degree, Undertaking, and Interested_Party, each with its own subcategories. Analyzing a corpus of 120 award-winning 3MT presentations across hard and soft disciplines, the study reveals notable disciplinary variations. Hard-discipline presenters employ importance markers more frequently, offering explicit explanations and attaching importance to systemic or functional roles central to their research. Conversely, soft-discipline presenters adopt a more implicit approach, emphasizing situational or contextual relevance. Additionally, hard-discipline presenters are more likely to position the general public as key stakeholders, strategically highlighting the societal impact and broader relevance of their research. By uncovering how epistemological traditions and audience expectations shape rhetorical choices, this study advances our understanding of interdisciplinary academic communication. It also has implications for pedagogical efforts to equip graduate researchers with effective rhetorical tools for articulating the significance of their work in time-constrained academic genres or contexts.

Key words: frame semantics; importance markers; linguistic expressions of importance; discipline; 3MT; three-minute thesis

1. Introduction

In the era of open science, which emphasizes transparency, accessibility, and collaborative research practices, the need for effective scientific communication has never been more critical (Belcher, 2023;

Carter-Thomas & Rowley-Jolivet, 2020; Luzón & Pérez-Llantada, 2022; Paltridge & Starfield, 2019). Technological advancements have expanded the reach of academic research, allowing scholars to engage with broader audiences and fostering public trust in science. As public engagement becomes a cornerstone of research dissemination, the Three Minute Thesis (3MT) competition has emerged as a key platform for graduate researchers to present their work in a concise, compelling way and develop their capacity to communicate with a wide audience (Boldt, 2019; Hu & Liu, 2018; Jiang & Qiu, 2022a, 2022b; Liu et al., 2023). The competition challenges participants to distill their research into a three-minute presentation that highlights its broader implications and societal relevance. Key to a successful presentation is the effective communication of research significance, as clarity, engagement, and impact constitute the competition's judging criteria[1]. Linguistic devices such as importance markers (e.g., *important*, *significant*, *top priority*) play a pivotal role in achieving these goals. These markers not only emphasize key findings but also shape audience perceptions of a study's value and relevance (Copeman, 2015; Feak, 2016; Jiang & Qiu, 2022b). When deployed strategically, they enhance a presenter's ability to captivate audiences, simplify complex ideas, and influence evaluations by judges and stakeholders (Deroey, 2015; Jiang & Qiu, 2022a).

While previous studies have explored importance markers in traditional academic genres such as research articles and lectures (e.g., Crawford Camiciottoli, 2004; Deroey & Taverniers, 2012; Zare et al., 2017), their use in time-constrained, spoken genres like the 3MT remains underexplored. The unique demands of the 3MT, including brevity, immediacy, and accessibility, may shape the deployment of these markers in ways distinct from other academic contexts. Furthermore, disciplinary epistemological norms and discursive practices (Hu & Liu, 2018; Hyland & Zou, 2021, 2022; Morton, 2009) may also influence how research significance is communicated in various hard and soft disciplines. Despite these potential influences, the intersection of disciplinary conventions and the strategic use of importance markers in the competitive, interdisciplinary genre of 3MT presentations has yet to be fully examined. The present study addresses this gap by investigating how 3MT presenters from different disciplines leverage importance markers to highlight research significance, engage audiences, prioritize key messages, and construct persuasive narratives under time constraints. Adopting a frame-semantic

[1] The judging criteria can be found at https://threeminutethesis.uq.edu.au/resources/judging-criteria.

approach (Fillmore, 1985), it examines the cognitive features of these markers and their role in guiding audiences toward the key ideas or focal messages of a presentation.

The study deepens our understanding of rhetorical strategies in interdisciplinary, public-facing academic communication and contributes to the growing focus on public engagement and interdisciplinary collaboration in disseminating scientific knowledge. It is guided by the following research questions:

(a) What semantic frames and frame elements associated with importance markers can be identified in 3MT presentations?

(b) How do presenters from soft and hard disciplines differ in their use of importance markers in 3MT presentations?

2. Previous research

2.1 Rhetorical structures and communication strategies in 3MT presentations

The 3MT competition, with its distinct blend of rhetorical structure, audience engagement, and cross-disciplinary dialogue, has garnered increasing scholarly attention. Hu and Liu (2018) identified eight common rhetorical moves employed by presenters across disciplines. Their findings highlighted disciplinary influences, with presenters in hard sciences prioritizing moves like Method to align with discipline-specific expectations. Jiang and Qiu (2022a) further demonstrated the prominence of the Results move in hard sciences in line with a disciplinary pursuit of empirical rigor.

Beyond structural analysis, research has explored how presenters make complex research more accessible to a general audience. Carter-Thomas and Rowley-Jolivet (2020) identified recontextualization strategies for enhancing clarity, whereas Kathpalia (2024) analyzed tactics like simplification and direct engagement that can foster audience connection. Furthermore, Liu et al. (2023) examined the use of code glosses to bridge disciplinary knowledge gaps and facilitate scientific communication. Another line of research explored how audience engagement in 3MT presentations varies across disciplines. Hyland and Zou (2022) examined rapport-building strategies and identified disciplinary variations in the deployment of engagement markers. Qiu and Jiang (2021) examined stance and engagement markers, reporting a dominance of stance markers, though presenters in hard sciences used more interactional features than their soft-discipline counterparts did. Jiang and Qiu

(2022a) observed that hard science presenters favored rationale- and results-focused language to align with audience expectations for empirical rigor, whereas Sun et al. (2024) found that soft-discipline presenters often used negation to contrast ideas and emphasize key points.

These studies highlighted how 3MT presenters would balance disciplinary norms and audience expectations through strategic rhetorical choices. However, while much attention has been given to general engagement strategies, the use of importance markers, which specifically highlight the relevance and significance of research, has received limited attention. Unlike general engagement markers that aim to capture audience interest, importance markers serve a more specific function in directing attention to the critical aspects of the research presented. Understanding how these markers function across disciplines can enhance our knowledge of how presenters convey the significance of their work.

2.2 Importance markers in academic communication

Research on importance markers in academic communication has illuminated their multifaceted role in emphasizing key points, enhancing comprehension, and engaging audiences. The term "importance markers," introduced by Lynch (2004), refers to "lexicogrammatical devices that overtly mark the importance, relevance, or significance of points presented verbally or visually" (Deroey, 2015, p. 52). The roles of these markers go beyond structural organization by integrating discourse management and evaluation, signaling relevance and shaping audience perceptions (Deroey & Taverniers, 2012). Scholars have explored importance markers under different names. For instance, "importance cues" (Kiewra, 2002) and "audience-oriented relevance markers" (Crawford Camiciottoli, 2007) underscore their role in managing the speaker-audience interaction. Other terms, such as "parameters of evaluation" (Hunston & Thompson, 2000), "value-laden vocabulary" (Fraser & Martin, 2009), and "attitude markers" (Hyland, 2005), highlight their evaluative functions, whereas "hyperbolic language to glamorize" (Millar et al., 2019) emphasizes their rhetorical nature.

Empirical research has examined the forms and functions of importance markers in academic lectures. Deroey and Taverniers (2012) analyzed the BASE corpus and identified common lexicogrammatical patterns, such as verb and noun constructions (e.g., "remember" and "the point is"), used to emphasize important or relevant points. Building on this work, Deroey (2015) categorized these

markers into interactive and textual types, highlighting their dual function in directing attention and aiding retention. Similarly, Zare et al. (2017) examined Persian academic lectures and identified five primary discourse functions, with audience engagement being the most frequent.

Several studies have specifically examined possible disciplinary differences in the use of importance markers in both spoken and written academic genres. Zare and Keivanloo-Shahrestanaki (2017) analyzed importance marking in 160 English academic lectures in the BASE corpus sampled from four disciplinary clusters: arts and humanities, social sciences, physical sciences, and life and medical sciences. The authors reported few disciplinary differences in highlighting importance, although lecturers in life and medical sciences were found to use "audience engagement" importance markers more frequently than those in the other clusters. They speculated that the observed tendency may have reflected an effort by these lecturers – all from a graduate-entry medical school – to increase interaction with their students. In the context of 3MT presentations, Qiu and Jiang (2021) found that presenters in hard disciplines, such as engineering and medicine, used attitude markers more frequently, many of which function as importance markers. Presenters from these disciplines often relied on hyperbolic language to emphasize the societal relevance of their research. This finding aligns with those of Hyland and Zou (2021), who observed that attitude markers expressing significance appeared more frequently in hard-discipline 3MT presentations than in soft-discipline ones, though the difference was not statistically significant. In another study, Jiang and Qiu (2022b) noted that hard-discipline students used more hypes—evaluative expressions that amplify the importance or novelty of their research— than their soft-discipline peers did. For example, expressions such as *the results are **promising*** and *an **innovative** technique* highlight the perceived value and impact of the research reported. Similar patterns were observed in case studies submitted to the UK's *Research Excellence Framework*, which evaluates the impact of research. For instance, Hyland and Jiang (2024) found that hard disciplines, such as chemistry and physics, tended to use more promotional language in their case studies than soft disciplines like history and education. Differences in disciplinary knowledge—such as the level of abstractness and theoretical orientation—were cited as factors contributing to variation in the use of promotional language, including importance markers, across disciplines.

Despite these valuable insights, there remains a gap in research regarding the role of importance

markers in the high-pressure, time-constrained environment of 3MT presentations. While previous studies have examined their frequency and form across disciplines, they have not addressed how these markers are cognitively deployed and linguistically realized under such high-pressure conditions. This study aims to address this gap by analyzing how presenters in 3MT competitions strategically use importance markers to maximize engagement and impact within the constraints of the format.

2.3 Linguistic resources in academic communication: a frame-semantic approach

Frame semantics, pioneered by Fillmore (1985), offers a robust theoretical and cognitive framework that links linguistic meaning to broader conceptual and contextual knowledge. Central to this theory is the idea that understanding the meaning of a word or an expression requires access to a semantic frame—a structured mental representation of a particular type of situation, along with its constituent frame elements involving participants, roles, and relations (Fillmore et al., 2003; Riemer, 2016). In this perspective, semantic meaning is not isolated or decontextualized but is embedded in and activated through cognitive frames that reflect our encyclopedic knowledge and expectations. This cognitive orientation makes frame semantics especially well-suited to the analysis of academic communication, where abstract and often discipline-specific concepts must be anchored in familiar knowledge structures to facilitate comprehension. By modeling meaning through interrelated elements, frame semantics provides insight into how speakers guide audiences through complex information using shared conceptual scaffolds. For instance, Example 1 (annotated in line with FrameNet)[2] from the corpus constructed for this study illustrates how the linguistic marker *important* evokes the Importance Frame.

(1) [Factor Sanitation treatment] is *IMPORTANT*[Target] [Field for the society] to function effectively [Undertaking in maintaining public health standards], [Explanation as it ensures the safe disposal of waste and the availability of clean drinking water].

This frame includes four frame elements: Factor (*Sanitation treatment*), identifying what is being assessed; Field (*the society*), specifying the domain of relevance; Undertaking (*in maintaining public health standards*), highlighting associated actions; Explanation (*as it ensures the safe disposal of waste...*), justifying the claimed importance. This structural analysis illustrates how speakers draw on

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[2] FrameNet (https://framenet.icsi.berkeley.edu/) is an online lexical database constructed according to frame semantics. The database contains an inventory of lexical units, semantic frames associated with these lexical units, their frame elements, examples sentences, and frame relations.

existing knowledge structures to frame and interpret significance—an inherently cognitive process.

Frame semantics has increasingly informed research on the cognitive and linguistic underpinnings of knowledge communication across genres. For example, Paltridge (1997) developed a framework for genre analysis based on frame semantics which he used to identify core characteristics of academic genres and intertextual genre relationships. Subsequent studies by Faber (2012) and Faber et al. (2007, 2009) applied frame-based terminologies to represent specialized knowledge, mapping complex domain-specific relationships and integrating linguistic and graphical representations. L'Homme and Robichaud (2014) drew on semantic frames to investigate the argument structures of terms referring to processes, events and properties in a terminological database and constructed field-specific conceptual scenarios based on identified frame relations. In more recent research, the frame-semantic approach has been extended to emotion-related markers in academic writing. Hu and Chen (2019) developed the Surprise Frame to analyze how academic writers deploy linguistic expressions of surprise to engage readers cognitively and affectively. Chen and Hu (2020a, 2020b) further explored disciplinary and diachronic variation in the use of surprise markers. Wang and Hu (2022) expanded this work by examining interest and confusion markers, and by proposing a broader Knowledge Emotion Frame to guide investigations into how the deployment of expressions of surprise/interest/confusion in academic writing related to variables such as discipline, gender, geographic academic location, and time (Wang & Hu, 2023a, 2023b, 2024a, 2024b, 2024c). These studies collectively underscore the centrality of cognition and emotion in shaping how academic knowledge is framed and received.

While there has been growing attention to cognitive-linguistic markers in academic writing, the role of importance markers in spoken academic genres remains under-explored. This is particularly relevant to 3MT presentations, where speakers are required to communicate complex research effectively and persuasively to non-specialist audiences. In such settings, linguistic markers like *important*, *critical*, and *essential* can highlight the value of the research concerned and guide the audience's attention strategically, thus serving both cognitive and rhetorical functions. Given the cognitive demands of processing condensed and sometimes relatively unfamiliar research content within a limited timeframe, presenters must strategically activate shared frames to ensure that the audience grasps why the research matters.

Unlike other common approaches to academic discourse such as metadiscourse (Hyland, 2005), the frame-semantic approach adopted in this study offers a cognitively informed and contextually rich perspective. It enables a deeper understanding of how 3MT presenters mobilize importance markers to construct meaning, foreground relevance, and enhance rhetorical impact under time constraints.

3. Method

3.1 Corpus

To address the research questions presented in the introduction, we compiled a corpus of 120 3MT presentations delivered by PhD candidates between 2018 and 2024. These presentations were selected from videos posted on the official 3MT website (https://threeminutethesis.uq.edu.au/) and YouTube, representing finalists from both university-wide and international competitions. To ensure the corpus reflected exemplary rhetorical and linguistic practices characteristic of this highly condensed academic genre, we selected award-winning presentations, including the Winner, Runner-Up, and People's Choice. The corpus comprised 60 presentations from hard disciplines (e.g., mathematics, chemistry, medicine, mechanical engineering, and biology) and 60 from soft disciplines (e.g., philosophy, education, applied linguistics, history, and sociology), totaling approximately 42,902 tokens. These disciplines were selected based on the widely recognized hard/soft distinction in academic research (Becher & Trowler, 2001). Hard disciplines, typically focused on empirical, quantitative research, are contrasted with soft disciplines, which are more interpretive and qualitative (Hu, 2018; Hyland & Zou, 2021). This classification aligns with established academic frameworks and allows for an examination of how these contrasting academic cultures influence the use of importance markers in 3MT presentations. When selecting the specific disciplines to represent the hard/soft distinction, we referenced previous research (e.g., medicine and education in Jiang & Qiu, 2022a; mechanical engineering and history in Hu & Liu, 2018) while also considering the availability of 3MT videos on the surveyed platforms. A detailed profile of the corpus is provided in Table 1.

Table 1 Profile of the 3MT corpus

Grouping	Discipline	Number of presentations	Length (words)
Hard disciplines	Mathematics	12	4,692
	Chemistry	10	3,760
	Medicine	15	6,120

	Mechanical Engineering	11	4,422
	Biology	12	4,308
Soft disciplines	Philosophy	8	3,176
	Education	12	4,584
	Applied Linguistics	7	2,793
	History	13	5,057
	Sociology	10	3,990
Total		120	42,902

A two-stage transcription procedure was employed for accuracy and reliability. Automated transcripts were first generated using iFlytek Listen, a speech recognition program capable of processing academic content and diverse accents. Recognizing the limitations of the software in capturing specialized terminology, two trained graduate students in applied linguistics manually reviewed the transcripts. They cross-checked the auto-transcribed texts against the original audios, correcting errors, resolving ambiguities, and ensuring accurate transcription of domain-specific vocabulary. They also verified speaker identification, noted non-verbal cues, and removed filler words unless they contributed to the discourse. Finally, one of the graduate students conducted a quality check to ensure consistency and completeness. This thorough process ensured that the transcripts accurately reflected the target linguistic features under examination.

3.2 Identification of relevant frames and their elements

This study adopted the same methodological procedures developed by Wang and Hu (2022) for deriving their Knowledge Emotion Frame to construct an Importance Frame, which treats lexical units as the primary units of analysis. Following Wang and Hu (2022), we employed the lexical approach adopted by FrameNet, a corpus-based computational lexicon of English that systematically maps words to semantic frames, to identify and classify lexical units (Ruppenhofer et al., 2016). In this approach, each lexical unit evokes a specific semantic frame and is linked to a set of frame elements that characterize the roles and relationships inherent in the conceptual scenario. FrameNet thus enables a nuanced representation of meaning by capturing how lexical meaning interacts with syntactic behavior in context.

In our study, FrameNet served as a key source of information for identifying importance-related lexical items and the semantic frames linked to them. We followed the guidelines provided by Ruppenhofer et al. (2016), who offered a comprehensive account of FrameNet's theoretical

underpinnings and annotation methodology, including the analysis of syntactic valence, frame element realization, and the organization of the lexicon through frame-to-frame relations. Of particular relevance to our analysis were frame-to-frame relations, which describe how different semantic frames are conceptually and hierarchically connected to one another. We also manually reviewed the lexical units in our dataset to confirm that each instance indeed evoked the assigned semantic frame, as defined and exemplified in FrameNet.

Accordingly, we implemented a multi-step process to identify relevant frames and frame elements associated with expressions of importance. First, a comprehensive list of synonyms and antonyms for the key lexical unit "important" and its derivative forms was compiled using *Thesaurus.com* and *Merriam-Webster's Thesaurus*, ensuring coverage of both British and American English usage. Then, to evaluate the relevance of these expressions in spoken academic contexts, the compiled list was piloted on two major academic spoken corpora: the British Academic Spoken English (BASE) and the Michigan Corpus of Academic Spoken English (MICASE). This step allowed us to filter out expressions unlikely to occur in spoken academic discourse.

To address the rhetorical specificity of 3MT presentations, we incorporated "hyping" items identified by Jiang and Qiu (2022b) in their corpus of 3MT presentations. Both Millar et al. (2019) and Jiang and Qiu (2022b) emphasize that hype markers serve a broader range of rhetorical functions, including highlighting novelty, value, and persuasive impact, in addition to emphasizing importance. In contrast, importance markers are more narrowly focused on establishing the relevance and significance of the research itself. For the purposes of our study, we specifically focused on the subset of hype markers identified by Jiang and Qiu (2022b) that directly emphasize the significance of research. To refine this subset, we conducted a manual review of the full transcriptions in our corpus, identifying additional expressions that were directly related to the concept of importance. This iterative process resulted in a curated final list of importance markers (see Appendix A). We then used this refined list as search queries to extract all relevant instances from the corpus. Each occurrence was manually verified to ensure that it conveyed the intended meaning of importance, excluding ambiguous cases where terms like *significant* did not denote importance (e.g., *significant declines*).

Next, the identified markers were classified according to their associated semantic frames as

defined by FrameNet. In instances where a marker was absent from FrameNet's lexical units, its classification was determined by assessing semantic similarity to existing entries. Finally, we developed an analytical scheme to categorize the frame elements associated with importance-related expressions and systematically applied it to all instances in our corpus. This process culminated in the development of a generalized Importance Frame. The frame is presented in Section 4.1, thereby addressing Research Question 1 by offering insights into how importance is expressed and framed in 3MT presentations.

3.3 Data coding and analysis

All identified importance markers in the corpus were coded based on the Importance Frame, which includes frame elements and their subcategories. To ensure coding reliability, a graduate student specializing in Applied Linguistics was trained to apply the coding scheme. A collaborative coding exercise was conducted on 30% of the importance markers, whereby the first author and the trained coder jointly coded and discussed these instances to achieve uniform interpretations of the frame elements and their subcategories. Any discrepancies were resolved through detailed discussions. For example, one discrepancy arose when coding *The discovery of CRISPR gene-editing technology* in the statement: "The discovery of CRISPR gene-editing technology is crucial because it has the potential to revolutionize medicine by enabling precise genetic modifications." Initially, one coder classified it as an Event, interpreting it as a specific, time-bound happening. However, the other coder viewed it as a Concept, focusing on CRISPR technology itself and its broader, long-term implications for medical science. After discussion, both coders agreed that the statement emphasized the conceptual significance of CRISPR technology, rather than the particular event of its discovery, hence coding the element as a Concept. The two coders independently coded the remaining importance markers in the corpus. A second round of discussions was then held to resolve any discrepancies that emerged, ensuring consistent application of the coding scheme across the full dataset. The inter-coder reliability analysis yielded a Cohen's kappa value of .77, indicating substantial agreement. The 95% confidence interval (CI) for the kappa statistic was between 0.71 and 0.83, suggesting strong inter-coder reliability. This means that we can be 95% confident that the true kappa value fell within this interval.

To address RQ1, MAXQDA 2018 Pro, a qualitative data analysis program that supports text coding, lexical searches, and annotation, was used for lexical searches and text annotations based on the

Importance Frame. Quantitative analyses were conducted to examine the distribution of frame elements in the corpus. Differences between disciplines were analyzed using binary logistic regression in SPSS 23.0, with the hard disciplines serving as the reference group. This method was chosen because importance markers and their respective frame elements were infrequent, making it impractical to use frequency-based analysis. Therefore, we coded the target features as present or absent, allowing us to compare the likelihood of frame elements occurring in soft disciplines and uncover possible discipline-specific discursive strategies. Bonferroni corrections were applied to adjust the alpha levels given that multiple statistical tests were conducted on the subcategories of the frame elements. This adjustment reduced the risk of Type I error (false positives) by lowering the significance threshold for each test, ensuring that the overall error rate remained controlled despite the multiple comparisons.

4. Results

4.1 The Importance Frame, its frame elements and subcategories

4.1.1 The Importance Frame

A total of 32 distinct importance markers with 118 occurrences were identified in our corpus. Table 2 lists these markers along with their respective frequencies. They span a range of parts of speech, including nouns (e.g., *priority*, *significance*), verbs (e.g., *matter*, *count*), adjectives (e.g., *crucial*, *vital*), adverbs (e.g., *crucially*, *importantly*), and phrases/structures (e.g., *mean a lot*, *play a prominent role in...*). Notably, three markers (i.e., *important*, *importantly*, and *critical*) each appeared more than 20 times, collectively accounting for 68% of all identified instances.

Table 2 Categories and frequencies of importance markers found in the corpus

Category	Importance marker (Frequency)
Noun	*importance* (3), *priority* (1), *significance* (1), *relevance* (1), *prominence* (1) *concern* (1), *relevance* (1), *primacy* (1)
Verb	*count* (1), *matter* (1), *note* (1), *highlight* (1)
Adjective	*important* (29), *critical* (25), *crucial* (4), *essential* (2), *major (*1), *vital* (1), *pivotal* (1), *necessary* (1), *significant* (2), *valuable* (1), *imperative* (1), *paramount* (1)

Adverb	*importantly* (26), *crucially* (3), *significantly* (1), *fundamentally* (1)
Phrase/structure	*mean a lot* (1), *play a prominent role* (1), *play a central role* (1),
	be integral to (1)

A FrameNet-based analysis revealed that the identified markers evoked three primary semantic frames: the Importance frame, the Being_necessary frame, and the Usefulness frame. The Importance frame, which constituted 78% of the occurrences, involves situations where "a Factor affects the outcome of an Undertaking", as defined by FrameNet. Lexical units such as *important*, *significant*, and *crucial* typically evoke this frame, reflecting an emphasis on factors deemed critical for achieving success. According to FrameNet, the Being_necessary frame, which accounts for approximately 15% of the identified instances, pertains to situations where "a dependent state-of-affairs has a Requirement as a prerequisite for obtaining or occurring". Words like *essential* and *necessary* often evoke this frame, highlighting the conditional requirements for achieving desired outcomes. Finally, the Usefulness frame, comprising 7% of the instances, involves cases where, in the words of FrameNet, "an Entity aids in the successful completion of a Purpose". Lexical units such as *valuable* evoke this frame, which, although less common, highlights the role of entities or actions that contribute to achieving specific objectives.

Drawing on the frame-frame relations found in FrameNet, the interconnections of the three identified frames were examined. As shown in Figure 1, these frames (Importance, Being_necessary, and Usefulness) are interconnected through the relations of Inheritance, Using, and Perspective_on. Inheritance signifies that semantic properties or truth values associated with the parent frame also apply to the child frame, whereas Using denotes a functional connection where elements of the scene evoked by the child frame reference or depend on those of the parent frame (Ruppenhofer et al., 2016). Perspective_on describes a connection between a general or neutral frame and a more specific frame that offers a unique viewpoint or interpretation of the former (Ruppenhofer et al., 2016). While some specific frames, such as Eventive_affecting, Gradable_attributes, and Required_event, are not directly evoked by importance markers in the corpus, they function as conceptual bridges between the primary frames of Importance, Being_necessary, and Usefulness. Identified through an analysis of frame-frame relations in FrameNet, these frames contribute to a deeper understanding of how importance is constructed and communicated. For example, the Eventive_affecting frame, though not explicitly

instantiated in our dataset, underlies the logic of how certain factors exert influence on outcomes. The Gradable_attributes frame offers insight into how varying degrees of importance are cognitively structured and rhetorically expressed. Likewise, the Required_event frame reflects conditions that must be fulfilled for success, highlighting the role of importance as a prerequisite for achieving desired results. Although these frames do not appear overtly in the data, they illuminate the implicit cognitive and communicative mechanisms that shape how significance is framed in academic presentations.
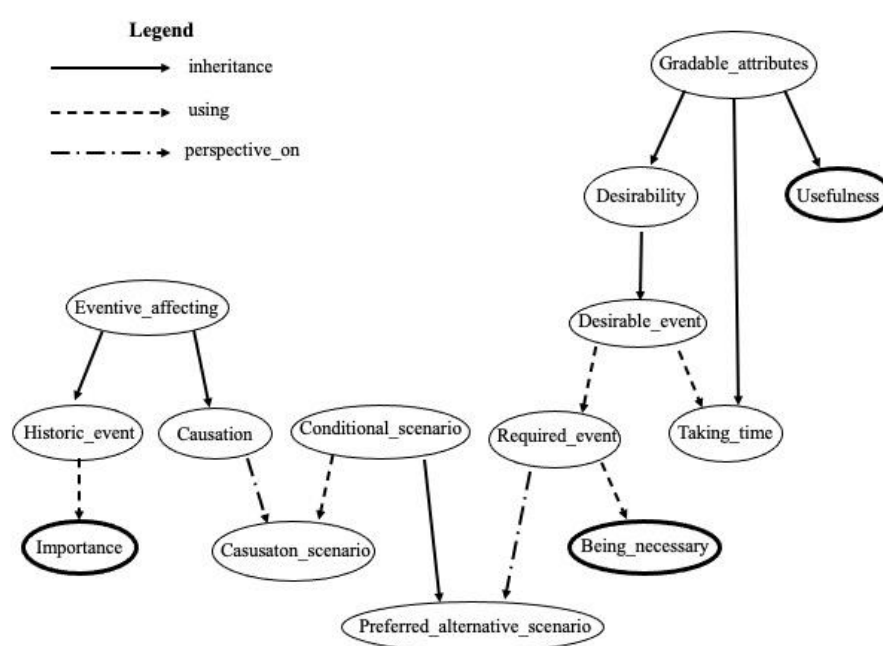
Figure 1. Frame-frame relations for the importance-related frames

To develop a generalized Importance Frame, all distinct frame elements from the three identified frames were extracted from FrameNet (Appendix B). These elements were subsequently used to identify and code instances of the importance-related frames found in the corpus, with their distributions presented in Table 3.

Table 3 Distributions of importance-related frame elements

Frame element	Raw frequency	Percentage of all frame instances
Factor	118	100.0
Undertaking	67	56.7

Explanation	43	36.4
Degree	31	26.3
Interested_party	22	18.6
Time	8	6.8
Field	5	4.2
Place	3	2.5
Purpose	2	1.7

As shown in Table 3, nine frame elements were identified in the importance-related frames in our corpus. Factor denotes the entity whose importance is assessed; Undertaking refers to the research activity emphasized; Explanation provides the reason for the claimed importance; Degree indicates the level of importance; Interested_Party refers to the individual or group affected; Time marks the temporal context; Field specifies the domain; Place indicates the geographical or spatial setting; and Purpose captures the intended goal or outcome that underscores the importance. Among these frame elements, Factor appeared in all instances of importance-related frames, reflecting its central role in the construal of importance. Undertaking and Explanation were the second and third most frequently occurring elements, accounting for approximately 57% and 36% of all frame instances, respectively. By contrast, Degree and Interested_Party were less frequent, appearing in 27% and 19% of the frame instances, respectively. The remaining elements, Time, Field, Place, and Purpose, occurred only sporadically. Given the distributions of the importance-related frame elements and the interconnections among the identified frames evoked by importance markers, a generalized Importance Frame was abstracted based on the key frame elements, as shown in Figure 2.
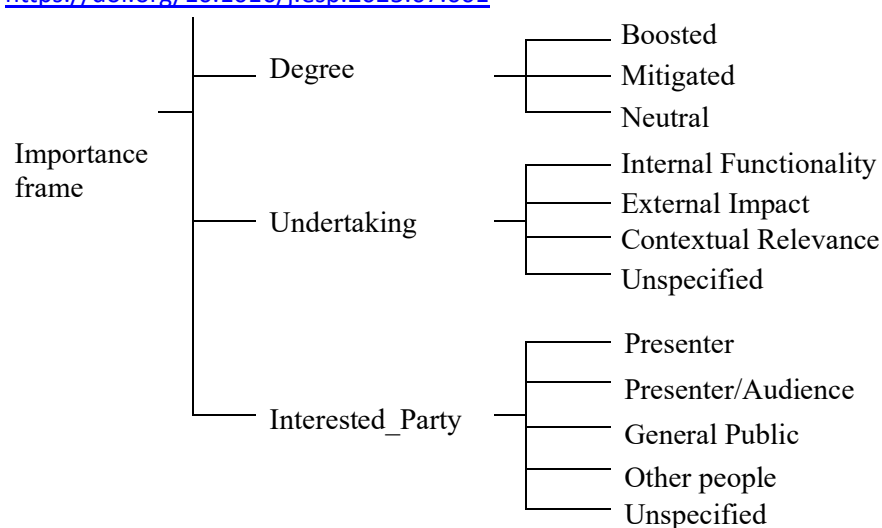
```
                        ┌──── Boosted
              Degree ───┼──── Mitigated
          ┌───          └──── Neutral
          │                   ┌──── Internal Functionality
Importance │                  ├──── External Impact
frame     ─┼── Undertaking ───┼──── Contextual Relevance
          │                   └──── Unspecified
          │                        ┌──── Presenter
          │                        ├──── Presenter/Audience
          └─── Interested_Party ───┼──── General Public
                                   ├──── Other people
                                   └──── Unspecified
```
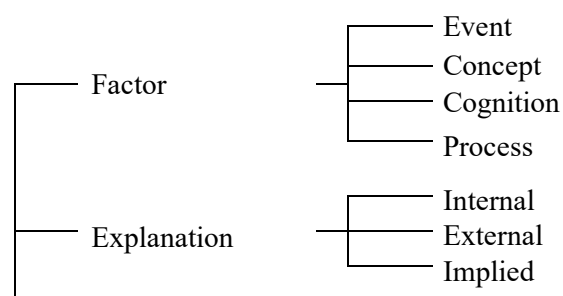
Figure 2 The Importance Frame

4.1.2 Frame element: Factor

Factor refers to a tangible or intangible element whose importance is being evaluated, and falls into one of four subcategories: Event, Concept, Cognition, and Process. Event pertains to a discrete, time-bound occurrence that signifies a specific happening, or moment with particular significance, as illustrated in Example 2. Concept, by contrast, refers to a broad, generalized, or abstract idea that explains or categorizes a phenomenon by focusing on its overarching impact and contribution to knowledge or society (Example 3). Cognition encompasses mental activities involved in acquiring knowledge, understanding, or engaging intellectually with a subject (Example 4). Finally, Process describes a series of ongoing or sequential actions, developments, or changes that lead to a specific outcome or result (Example 5). In the present corpus, the four categories of Factor (in the order presented above) accounted for 41%, 37%, 12%, and 10% of the frame instances, respectively. This distribution reveals a clear emphasis on specific events and broader conceptual advances in conveying research significance, showing that presenters prioritized concrete, impactful moments and overarching concepts to highlight the relevance of their research.

(2) [Factor The fall of the Berlin Wall] in 1989 marked an *IMPORTANT* Target moment in history. (Soft Disciplines)

(3) [Factor Genetic diversity] is *ESSENTIAL* Target for maintaining the stability and adaptability of ecosystems in the face of environmental changes. (Hard Disciplines)

(4) [Factor Understanding how the brain processes sensory information] is *CRUCIAL* Target for developing treatments for neurological disorders. (Hard Disciplines)

(5) [Factor The gradual shift in societal attitudes toward gender equality] is *VITAL* Target for ensuring the development of inclusive policies that promote equal rights in the workplace. (Soft Disciplines)

4.1.3 Frame element: Explanation

The rationale or justification for claimed importance can be signaled either explicitly or implicitly. In this study, the distinction between explicit and implicit explanations is based on whether the reasoning behind the perceived importance is directly stated or merely suggested without overt articulation. Explicit explanations are typically marked by clear linguistic cues (e.g., causal connectives such as *because*) and are further categorized as internal or external based on their focus. Internal explanations pertain to the inherent characteristics, intrinsic qualities, and mechanisms within a subject or system that contribute to its perceived significance, as seen in Example 6. In contrast, external explanations emphasize conditions, influences, or consequences that arise outside the subject, underscoring its broader implications and relevance in larger societal contexts, as illustrated in Example 7. Implicit or implied explanations, exemplified in Example 8, involve cases where the rationale behind the claimed importance is not fully articulated. While certain linguistic cues, such as the verb *understand* in Example 8, may signal a connection to the explanation, these cues alone do not provide sufficient detail or reasoning to be coded as explicit explanations. In the corpus, 69% of the frame instances provided explicit explanations, with internal factors accounting for 43% and external factors 26%.

(6) And this is *IMPORTANT* Target [Explanation because in the brain Npas4 is responsible for building these red lights]. (Hard Disciplines)

(7) The study of biodiversity is *IMPORTANT* Target [Explanation because it provides insights into how diverse species contribute to the stability and functioning of environments that support human life and resources]. (Hard Disciplines)

(8) This research is one *IMPORTANT* Target piece of the puzzle in understanding the complex relationship between social media use and mental well-being among adolescents. (Soft Disciplines)

4.1.4 Frame element: Degree

The strength of the evaluation can be modulated, resulting in boosted (Example 9) or mitigated

(Example 10) evaluations. In the corpus, however, the majority of frame instances (71%) fell into the "Neutral" category, indicating that the expressed evaluation was neither boosted nor weakened (Example 11). While 24% of the instances featured boosted evaluations, only 5% were mitigated. Notably, when evaluations were boosted, various intensifiers such as *so*, *really* and *particularly* were used. Conversely, the preferred hedge for mitigating evaluations was *possibly*.

(9) This research on advanced imaging techniques like 3D mammography for early breast cancer detection is [Degree really] *IMPORTANT* Target, because it can improve early diagnosis and survival rates. (Hard Disciplines)

(10) The role of trade routes in shaping ancient civilizations is [Degree possibly] *IMPORTANT* Target for understanding the economic dynamics of that era. (Soft Disciplines)

(11) Macrophages, the other cell type infected by HIV, also play an *IMPORTANT* Target role as reservoirs. (Hard Disciplines)

4.1.5 Frame element: Undertaking

Undertaking refers to a specific action, process, or function of the subject being evaluated in relation to achieving a particular goal or outcome in a given context. Four subcategories were identified: Internal Functionality, External Impact, Contextual Relevance and Unspecified. Internal Functionality (31% of the frame instances) refers to essential processes or mechanisms within a system that contribute to its core functions and objectives, as illustrated in Example 12. External Impact (17%) focuses on the broader societal effects or consequences of these actions, emphasizing their external significance, as demonstrated in Example 13. Contextual Relevance (25%) underscores the importance of actions or elements in relation to specific circumstances or environments, demonstrating how context influences their perceived impact (Example 14). Finally, Unspecified (27%) includes instances where the significance or categorization of elements is not clearly defined, as shown in Example 15.

(12) PR is like a little antenna that can send signals within our cells to communicate and carry out *IMPORTANT* Target functions [Undertaking for the reproductive process] including menstruation, pregnancy, and sexual development. (Hard Disciplines)

(13) The Industrial Revolution was *IMPORTANT* Target [Undertaking for transforming urban landscapes], creating new social dynamics that influenced labor movements and economic policies. (Soft

Disciplines)

(14) The use of code-switching is *IMPORTANT* [Target] in bilingual classrooms [Undertaking for fostering effective communication and comprehension]. (Soft Disciplines)

(15) Understanding the patient's lifestyle and dietary habits is *CRUCIAL* [Target]. (Hard Disciplines)

4.1.6 Frame element: Interested_Party

Interested_Party refers to an individual or group that has a personal stake in the evaluation, and comprises five subcategories: Presenter, Presenter/Audience, General Public, Other People, and Unspecified. The Presenter subcategory (16% of the frame instances) highlights the speaker's personal connection to the topic, emphasizing its importance from a self-referential perspective, as shown in Example 16. The Presenter/Audience subcategory (24%) reflects a shared relevance, bridging the speaker's expertise with the audience's interests (Example 17). The General Public subcategory, which was the most prevalent (37%) in the corpus, broadens the scope to societal significance, aligning with the 3MT's objective of engaging a wider audience (Example 18). The subcategory of Other People (5%) focuses on specific third-party stakeholders, such as experts or practitioners (Example 19), whereas the Unspecified subcategory (18%) includes cases where the stakeholder remains ambiguous or implicit (Example 20).

(16) This is really *IMPORTANT* [Target] [Interested_Party to me] as a white anti-racist community organizer in 2023. (Soft Disciplines)

(17) The preservation of historical artifacts is *VITAL* [Target] [Interested_Party to us], as it enhances our understanding of cultural heritage and educates future generations about our history. (Soft Disciplines)

(18) It is *IMPORTANT* [Target] for [Interested_Party the community] to be aware of the changes in local wildlife populations. (Hard Disciplines)

(19) This discovery is *IMPORTANT* [Target] [Interested_Party for clinicians and researchers] working to combat antibiotic resistance. (Hard Disciplines)

(20) DNA extraction is arguably the most *IMPORTANT* [Target] step in DNA analysis. (Hard Disciplines)

4.2 Cross-disciplinary differences in the use of importance markers

Focusing on the importance markers identified in the corpus, including their associated frame elements

and subcategories, we analyzed the relationship between presenters' disciplinary background and their use of these markers. Table 4 presents the results of a binary logistic regression analysis on the overall use of importance markers. The model accounted for approximately 14% of the variance in the dependent variable, as indicated by the Nagelkerke R^2 value. Notably, presenters from hard disciplines were 2.1 times more likely than those from soft disciplines to employ importance markers in their 3MT presentations.

Table 4 Results of the binary logistic regression on the overall use of importance markers

Outcome	Predictor	*B*	*SE*	*Wald*	Odds ratio (OR)	95% CI for OR Lower	Upper
Importance	Hard vs. Soft	0.426	0.415	0.829***	2.071	0.632	1.837
	Constant	0.213	0.351	0.649	0.272		
	$R^2 = .007$ (Cox & Snell); $R^2 = .135$ (Nagelkerke). Model χ^2 (2) = 10.674, $p < .001$						

***p < .001

Table 5 presents the logistic regression results for the subcategories of the frame element of Factor. The analyses found no significant differences between presenters from hard and soft disciplines, indicating that disciplinary background did not influence how importance was attributed to these factors.

Table 5 Results of binary logistic regressions on the frame element of Factor

Outcome	Predictor	*B*	*SE*	*Wald*	Odds Ratio (OR)	95% CI for OR Lower	Upper
Event	Hard vs. Soft	0.289	0.516	4.048	2.034	0.417	4.624
	Constant	0.141	0.714	5.074			
	$R^2 = .037$ (Cox & Snell); $R^2 = .216$ (Nagelkerke). Model χ^2 (2) = 9.335, $p = .071$						
Concept	Hard vs. Soft	0.313	0.464	4.189	1.139	0.418	5.184
	Constant	1.613	0.317	5.158			
	$R^2 = .025$ (Cox & Snell); $R^2 = .123$ (Nagelkerke). Model χ^2 (2) = 9.173, $p = .063$						
Cognition	Hard vs. Soft	-2.171	0.381	6.825	2.124	0.692	7.022
	Constant	1.104	0.447	7.242			
	$R^2 = .021$ (Cox & Snell); $R^2 = .402$ (Nagelkerke). Model χ^2 (2) = 8.384, $p = .058$						
Process	Hard vs. Soft	-4.558	0.543	7.211	1.107	0.357	5.146
	Constant	1.428	0.411	6.174			
	$R^2 = .013$ (Cox & Snell); $R^2 = .212$ (Nagelkerke). Model χ^2 (2) = 6.217, $p = .083$						

Turning to the Explanation frame element, as detailed in Table 6, the results indicate that disciplinary background reliably predicted the likelihood of offering an explicit explanation for the claimed importance. The model explained approximately 15% of the variance (Nagelkerke R^2). Presenters from hard sciences were 1.8 times more likely to provide explicit explanations compared to their soft-discipline counterparts, who were more likely to leave the evaluation unexplained.

Table 6 Results of binary logistic regressions on the frame element of Explanation

Outcome	Predictor	B	SE	$Wald$	Odds Ratio (OR)	95% CI for OR Lower	Upper
Internal Factor	Hard vs. Soft	0.413	0.314	4.285	1.725	0.352	5.282
	Constant	1.213	0.423	6.529			
	R^2 = .025 (Cox & Snell); R^2 = .123 (Nagelkerke). Model χ^2 (2) = 9.173, p = .072						
External Factor	Hard vs. Soft	-4.558	0.543	7.211	1.107	0.357	5.146
	Constant	1.428	0.411	6.174			
	R^2 = .013(Cox & Snell); R^2 = .212 (Nagelkerke). Model χ^2 (2) = 6.217, p = .059						
Implied	Hard vs. Soft	-0.321	0.372	2.117**	0.558	0.722	6.027
	Constant	-1.141	0.472	3.032*			
	R^2 = .011 (Cox & Snell); R^2 = .146 (Nagelkerke). Model χ^2 (2) = 11.185, p < .001						

*p < .05; **p < .01

Textual analysis further illustrates how disciplinary differences manifested linguistically. In hard disciplines, explanations often foregrounded causal mechanisms and functional processes, as illustrated by Examples 6 and 7 (see section 4.1), where importance was justified through concrete outcomes and clearly stated rationales. In contrast, soft-discipline presentations, as exemplified by Example 8, tended to imply rather than explicitly articulate the basis for importance. This implicitness seemed to reflect the soft disciplines' preference for interpretive framing and broader contextual significance.

Regarding the Degree frame element, the analyses presented in Table 7 revealed no significant relationship between disciplinary background and the three subcategories. This suggests that hard- and soft-discipline presenters exhibited comparable tendencies in describing the degree of importance attributed to various factors.

Table 7 Results of binary logistic regressions on the frame element of Degree

Outcome	Predictor	*B*	*SE*	*Wald*	Odds Ratio (OR)	95% CI for OR Lower	Upper
Neutral	Hard vs. Soft	0.278	0.245	0.726	1.041	0.741	8.219
	Constant	-1.067	0.482	1.324			
	R^2 = .172 (Cox & Snell); R^2 = .166 (Nagelkerke). Model χ^2 (2) = 9.122, *p* = .085						
Mitigated	Hard vs. Soft	0.063	0.353	2.824	0.527	1.924	7.181
	Constant	1.242	0.474	6.219			
	R^2 = .077 (Cox & Snell); R^2 = .112 (Nagelkerke). Model χ^2 (2) = 9.231, *p* = .072						
Boosted	Hard vs. Soft	-1.758	0.525	1.531	0.524	0.955	2.544
	Constant	-1.322	0.525	6.216			
	R^2 = .046 (Cox & Snell); R^2 = .111 (Nagelkerke). Model χ^2 (2) = 9.655, *p* =.069						

For the Undertaking frame element, as summarized in Table 8, disciplinary background was a significant predictor for both the Internal Functionality and Contextual Relevance subcategories. The models accounted for 17% and 21% of the variance, respectively. Soft-discipline presenters were 1.6 times more likely to associate importance with contextual factors, whereas hard-discipline presenters were 2.5 times more likely to emphasize the essential role of an element within a system or process.

Table 8 Results of binary logistic regressions on the frame element of Undertaking

Outcome	Predictor	*B*	*SE*	*Wald*	Odds Ratio (OR)	95% CI for OR Lower	Upper
Internal Functionality	Hard vs. Soft	1.869	0.234	2.453***	2.467	1.684	6.124
	Constant	1.326	0.355	2.266*			
	R^2 = .055 (Cox & Snell); R^2 = .171 (Nagelkerke). Model χ^2 (2) = 9.334, *p* < .001						
External Impact	Hard vs. Soft	1.445	0.532	3.243	1.534	0.263	2.655
	Constant	1.113	0.323	2.146			
	R^2 = .015 (Cox & Snell); R^2 = .134 (Nagelkerke). Model χ^2 (2) = 10.242, *p* = .041						
Contextual Relevance	Hard vs. Soft	-1.362	0.471	2.825**	0.635	0.792	6.218
	Constant	-2.017	0.518	4.725*			
	R^2 = .046 (Cox & Snell); R^2 = .211 (Nagelkerke). Model χ^2 (2) = 9.655, *p* < .001						
Unspecified	Hard vs. Soft	0.849	0.535	4.873	2.352	0.983	6.975
	Constant	1.268	0.317	5.218			
	R^2 = .211 (Cox & Snell); R^2 = .303 (Nagelkerke). Model χ^2 (2) = 8.226, *p* = .063						

*p < .05; **p < .01; ***p < .001

The above Undertaking-related differences are evident in Examples 12 and 14. In Example 12, the hard-discipline presenter frames importance in terms of biological functionality, emphasizing how

elements operate within a system – a perspective aligned with the structural logic of STEM fields. In contrast, Example 14 reflects a soft-discipline approach, where importance is tied to educational effectiveness and social context, illustrating a human-centered, situational framing typical of the humanities and social sciences.

Finally, for the frame element of Interested_Party (Table 9), the analyses showed that disciplinary background reliably predicted the incidence of the General Public subcategory, explaining 22% of the variance (Nagelkerke R^2). Hard-discipline presenters were 1.8 times more likely than their soft-discipline counterparts to identify the general public as a key stakeholder in evaluating importance. No significant disciplinary differences were found in the use of other subcategories.

Table 9 Results of binary logistic regressions on the frame element of Interested_Party

Outcome	Predictor	*B*	*SE*	*Wald*	Odds Ratio (OR)	95% CI for OR Lower	Upper
Presenter	Hard vs. Soft	2.063	0.379	1.482	1.831	1.924	8.174
	Constant	1.722	0.438	2.159			
	$R^2 = .045$ (Cox & Snell); $R^2 = .121$ (Nagelkerke). Model $\chi^2 (2) = 9.032$, $p =.073$						
Presenter/	Hard vs. Soft	1.741	0.387	3.243	1.534	1.263	7.655
Audience	Constant	1.183	0.491	2.116			
	$R^2 = .015$ (Cox & Snell); $R^2 = .134$ (Nagelkerke). Model $\chi^2 (2) = 10.242$, $p = .044$						
General Public	Hard vs. Soft	1.362	0.471	2.825 [b]	1.765	0.792	6.218
	Constant	2.215	0.412	3.725 [a]			
	$R^2 = .036$ (Cox & Snell); $R^2 = .217$ (Nagelkerke). Model $\chi^2 (2) = 8.692$, $p < .001$						
Other People	Hard vs. Soft	0.849	0.535	4.873	1.352	0.922	8.945
	Constant	1.268	0.412	5.258			
	$R^2 = .201$ (Cox & Snell); $R^2 = .313$ (Nagelkerke). Model $\chi^2 (2) = 7.126$, $p = .062$						
Unspecified	Hard vs. Soft	0.749	0.437	4.883	3.352	0.781	7.925
	Constant	1.218	0.338	5.214			
	$R^2 = .321$ (Cox & Snell); $R^2 = .503$ (Nagelkerke). Model $\chi^2 (2) = 9.276$, $p = .078$						

[a] $p < .05$; [b] $p < .01$

Textual analysis supported the above-reported quantitative finding that hard-discipline presenters more often referenced the general public as stakeholders. The hard-discipline presenter in Example 18 appeals to the informational needs of "the community," linking importance to shared knowledge and collective responsibility. This broader, depersonalized framing aligns with the public-oriented, evidence-based ethos often associated with STEM fields, where the emphasis tends to be on the

collective, societal impact of research. Conversely, the soft-discipline presenter in Example 16 foregrounds personal identity and moral positioning, using *to me* to anchor importance in subjective experience and activist stance. This individualized framing reflects the interpretive, self-reflexive emphasis of the humanities and social sciences.

Table 10 summarizes the significant cross-disciplinary differences in the use of importance markers, as well as the associated frame elements and their subcategories, identified in the corpus. Overall, presenters from hard disciplines were more likely to use importance markers than their soft-discipline counterparts. Regarding the Explanation frame element, hard disciplines tended to offer explicit explanations to justify the perceived importance of their research. For the Undertaking frame element, soft-discipline presenters were more likely to link the importance of their research to contextual factors, whereas hard-discipline presenters emphasized internal functionality. When it comes to the Interested_Party frame element, hard-discipline presenters were more inclined to identify the general public as a key stakeholder in assessing the importance of their research. No significant differences were found between the two groups in their use of the Factor and Degree frame elements.

Table 10 Summary of cross-disciplinary differences in the use of importance markers

Importance marker	Discipline
Overall use	Hard > soft
Factor	
Event	No
Concept	No
Cognition	No
Process	No
Explanation	
Internal Factor	No
External Factor	No
Implied	Hard < soft
Degree	
Neutral	No
Mitigated	No
Boosted	No
Undertaking	
Internal Functionality	Hard > soft
External Impact	No

Contextual Relevance	Hard < soft
Unspecified	No
Interested_Party	
Presenter	No
Presenter/Audience	No
General Public	Hard > soft
Other People	No
Unspecified	No

No = no significant difference; >= more likely; < = less likely

5. Discussion

5.1 The role of importance markers in 3MT presentations

The Importance Frame proposed in this study provides a holistic representation of meaning by capturing how importance is contextually shaped, rather than being conveyed through isolated words or phrases. For example, in "Understanding gut microbiota is important in developing personalized medicine, as it enables more precise diagnostics and targeted treatments for individuals with chronic inflammatory diseases", the word *important* gains meaning from the surrounding frame elements: the research focus (*understanding gut microbiota*), the field of relevance (*personalized medicine*), the justification (*enables more precise diagnostics and treatments*), and the target population (*individuals with chronic inflammatory diseases*). These elements work together to construct a coherent and compelling sense of importance, demonstrating how the perceived value of research is shaped by both what is said and how it is contextually framed. This framework provides valuable insights into how 3MT presenters effectively address the cognitive, rhetorical, and promotional demands of their presentations.

From a cognitive perspective, importance markers help scaffold complex knowledge by distinguishing between what is "essential" and "peripheral," preempting cognitive overload for non-specialist audiences. For instance, one presenter from mechanical engineering stated: "The suspension system is important for the smooth operation of high-speed trains." Here, the frame element Undertaking (*for the smooth operation...*) emphasizes what the system does rather than merely describing what it is. By framing the technical concept in terms of its function, the presenter links the unfamiliar mechanism to an intuitive experience—a stable and comfortable ride. This functional contextualization reduces cognitive load by allowing non-specialist audiences to understand the practical relevance of the suspension system without needing detailed knowledge of mechanical

dynamics, thereby enhancing both comprehension and retention. From a rhetorical perspective, importance markers function as persuasive tools that help presenters establish epistemic authority and align their work with the values of their audience. For instance, one presenter from the discipline of history stated, "This research is crucial for us to understand the socio-economic transformations that shaped modern society." The frame element of Interested_Party (*us*) positions the research as socially relevant, creating a sense of shared responsibility between the speaker and the audience. Using the pronoun *us*, the presenter invites the audience to see themselves as directly connected to the research, suggesting that the socio-economic changes being studied are not just academic concepts but have had a tangible impact on the audience's own social reality. This rhetorical strategy deepens the connection between the research and the audience by aligning the study with their values and concerns, making it more relatable and personally significant. In turn, this enhances the credibility of the research, strengthens the bond with the audience, and ultimately boosts public engagement to ensure effective knowledge dissemination (Jiang & Qiu, 2022b). From a promotional standpoint, importance markers play a crucial role in boosting the perceived impact of research by positioning it within academia's competitive landscape. For instance, one medical researcher stated: "This breakthrough is a critical step toward developing a cure for Alzheimer's disease." The phrase *critical step* frames the research as a significant advancement in the field, underscoring its potential to address a major global health issue. This emphasis highlights the urgency of the research and its relevance to both medical professionals and the general public, positioning it as vital to the ongoing battle against Alzheimer's. In an era where visibility is highly valued and higher education increasingly embraces an entrepreneurial approach (Hyland, 2023), importance markers help amplify the reach, appeal, and potential impact of the research, ultimately enhancing its visibility and recognition in a crowded academic field.

An interesting finding in our study is that 69% of instances expressing importance in 3MT presentations included explicit explanations, a notable contrast to Wang and Hu's (2022) finding that more than two-thirds of expressed knowledge emotions (i.e., surprise, interest, and confusion) in research articles were not explained. This difference highlights the distinct communicative goals of the two genres. In research articles, expressions of emotions often rely on implied justifications, assuming a shared disciplinary understanding between author and reader (Hu & Chen, 2019; Wang & Hu, 2022).

In contrast, 3MT presentations target a multidisciplinary or non-specialist audience, where clarity and accessibility are paramount. Therefore, presenters frequently offer explicit explanations to ensure that their research's significance is fully understood, even by those without specialized knowledge.

Additionally, our study revealed that only 19% of importance-related instances in 3MT presentations did not identify the affected stakeholders. This differs from Wang and Hu's (2022) finding that a large majority of expressed knowledge emotions in research articles lack an experiencer (the person who feels the emotion). This difference stems from 3MT presenters' communicative need to clearly identify stakeholders, ensuring that the relevance of their research is effectively conveyed to a broader audience. By explicitly naming stakeholders, 3MTpresenters clarify who benefits from or is impacted by the research, humanizing the message and fostering a deeper connection with the audience. This strategy not only makes the research more relatable but also enhances audience engagement.

5.2 Disciplinary influences on the use of importance markers

As presented earlier, our study revealed notable disciplinary differences in how importance was framed. Hard-discipline presenters used importance markers more frequently, provided explicit explanations, and attached importance to functional or systemic roles central to their research. In contrast, soft-discipline presenters tended to make implicit evaluations, focusing on contextual or situational relevance. Additionally, hard-discipline presenters were more likely to position the general public as key stakeholders, emphasizing societal impact and public engagement.

The finding that hard-discipline presenters tended to use importance markers more frequently than their soft-discipline counterparts contrasts with those of earlier studies, such as Carter-Thomas and Rowley-Jolivet (2020), that reported minimal disciplinary differences in 3MT presentations. However, their study, which focused on general presentation patterns, did not specifically examine the role of importance markers. Moreover, their relatively small corpus of 30 presentations may have been insufficient to capture the nuanced disciplinary variations identified in our larger dataset. Similarly, our results diverge from Zare and Keivanloo-Shahrestanaki's (2017) findings about limited disciplinary differences in the use of importance markers in academic lectures. This discrepancy may be attributed to genre-specific communicative demands. While academic lectures typically offer more time for detailed explanation and contextualization, 3MT presentations, designed for a diverse audience with

varying levels of subject knowledge, require more strategic use of importance markers to ensure clarity and audience engagement with the key messages.

Consistent with the observations of Qiu and Jiang (2021), Jiang and Qiu (2022b) and Hyland and Zou (2022), our study found that presenters from hard disciplines were more likely to underline the significance of their research. This trend may reflect the practical imperatives in hard sciences, such as securing funding, fostering industry collaborations, and responding to output-driven demands (D'Este & Robinson-García, 2023; Jiang & Qiu, 2022b). In fields like engineering or physics, where technical concepts are often discussed, presenters may feel a greater need to highlight the societal relevance and potential impact of their work (D'Este & Robinson-García, 2023; Hyland & Zou, 2022). Importance markers like "this has significant implications for..." serve as linguistic resources for highlighting the broader applicability of their research for non-specialist audiences.

In contrast, soft-discipline research is often "more immediately relevant to a much broader range of public discussion" (Lewis et al., 2023, p. 2) and tends to resonate more naturally with audiences by addressing socially oriented or relatable topics (Carter-Thomas & Rowley-Jolivet, 2020; Hyland & Zou, 2022; Stehr & Ruser, 2016). As a result, presenters in soft disciplines may prefer to convey the significance of their research through storytelling, contextual framing, and backgrounding, rather than through direct statements of importance. For example, in a soft-discipline presentation on mental health, the presenter positioned her research within the broader global context of well-being, emphasizing the growing societal awareness of mental health issues. Instead of explicitly stating the importance of her research, she shared a personal anecdote about a close friend who had struggled with depression and how this personal experience opened her eyes to the gaps in mental health care. She described how her friend's inability to find proper support motivated her to pursue research that could inform policy and improve resources for mental health care. By framing her study through this personal narrative, she subtly conveyed the significance of her work in influencing social policies without directly stating it. This approach echoes Jiang and Qiu's (2022a) finding that social science presenters often rely on storytelling and contextualization to communicate relevance.

Our study found that hard-discipline presenters were more likely to offer explicit justifications for the claimed importance of their research, reflecting the distinct epistemological foundations of these

fields. Rooted in positivist paradigms, hard sciences prioritize addressing concrete, practical issues and advancing knowledge with measurable applications (Becher & Trowler, 2001; Fløttum et al., 2006; Hu, 2018). Research in these disciplines is often evaluated based on its capacity to provide tangible solutions, improve technological systems, or inform policy (Hyland, 2005; Hyland & Zou, 2022; Jiang & Qiu, 2022a). This orientation compels presenters to explicitly justify the real-world impact of their work, emphasizing practical relevance, such as revolutionizing energy systems or enhancing medical treatments. This aligns with the dynamics of a "persuasive economy," where research is judged by its immediate, demonstrable returns (Fecher et al., 2021; Kagan, 2009). In contrast, soft disciplines, often grounded in constructivist paradigms, prioritize intellectual positioning and long-term contributions over immediate applicability (Becher & Trowler, 2001; Fecher et al., 2021; Kagan, 2009). Presenters in these disciplines often employ complex arguments to signal significance, catering to audience expectations for conceptual depth rather than practical outcomes.

We found no significant disciplinary differences in the use of boosted or mitigated importance markers. This contrasts with Hyland and Zou's (2022) finding that hard science presenters more frequently used boosters and hedges, which may reflect the emphasis on certainty and objectivity in their field. However, our analysis examined how boosters and hedges interacted with importance markers to highlight research significance. We found that presenters from both hard and soft disciplines prioritized clarity and accessibility, signaling the importance of their work in ways that resonated with general audiences. This suggests that, in the 3MT context, presenters in both hard and soft disciplines focus on engaging the wider public, rather than relying on boosting or hedging markers alone.

As reported earlier, our study revealed cross-disciplinary variations in how the specific actions or functions of the evaluated subject were framed as contributing to achieving particular outcomes. In hard disciplines, presenters often anchored the significance of their research in its essential role within a broader system or process, focusing on precision, functionality, and problem-solving. This approach typically involved articulating causal relationships and demonstrating how their findings contributed to solving concrete problems (Hyland & Zou, 2022; Jiang & Qiu, 2022a; Muis et al., 2006; Nesi & Holmes, 2010; Qiu & Jiang, 2021). For example, one mechanical engineering presenter emphasized how the development of a new heat exchanger design was critical in improving energy efficiency in industrial

processes. By illustrating how this component operates within the larger system of heat management in manufacturing plants, the presenter framed the significance of his research in terms of its practical impact on energy consumption, which is a key concern in industrial sustainability. This framing aligns with hard sciences' focus on inferred structures or processes that, while not directly observable, have significant practical implications (Christensen et al., 2015; Kolb, 1981). In contrast, soft-discipline presenters tended to associate the importance of their research with specific contextual or situational factors. For instance, one presenter reported how adolescents' mental health outcomes were influenced by the social environment, particularly peer pressure and family dynamics. This strategy reflects soft disciplines' emphasis on the contingency of phenomena, which are often understood in relation to social, cultural, and situational contexts, rather than as universally applicable principles (Fecher et al., 2021; Kagan, 2009). In such cases, presenters adapt their rhetoric to bridge theoretical insights with context-driven implications, positioning their research as a tool for addressing real-world complexities.

Finally, hard-discipline presenters were more likely to frame the significance of their research in terms of its societal impact. Disciplines like biology, engineering, and medicine often prioritize research aimed at "creating social and economic value and the belief in the satisfaction of end users" (Qiu & Jiang, 2021, p. 9). As a result, the general public becomes a natural stakeholder and beneficiary of their findings. This societal orientation has been further amplified by shifts in science governance, where research is increasingly evaluated not only for its scientific significance but also for "the value it appears to generate for society" (Fecher et al., 2021, p. 1). For instance, in one engineering presentation, the researcher linked her work on renewable energy technology to environmental sustainability, emphasizing its potential to reduce carbon emissions and mitigate climate change. This connection to global environmental goals reflects science communication norms that prioritize accessibility and public engagement (Bondi et al., 2015; Carter-Thomas & Rowley-Jolivet, 2020; Jiang & Qiu, 2022a, 2022b). Such communication norms are reinforced by the huge amounts of funding that hard-discipline research projects typically attract and the growing expectation that publicly funded research must deliver social and economic returns (Owen et al., 2012). Furthermore, framing one's work in terms of tangible benefits is relatively straightforward in hard disciplines. In contrast, soft-discipline researchers have fewer direct pathways to commercialization and hence are less inclined to articulate explicit value

propositions. Soft disciplines' orientation toward qualitative, interpretive or constructivist approaches, as well as their tendency to emphasize context-sensitive understandings of complex and/or contested social issues such as race, gender, and inequality (Becher & Trowler, 2001; Geertz, 1973), would predispose presenters to embed their evaluations implicitly, while foregrounding contextual or situational relevance over claims of impact. Presenters in both hard and soft disciplines endeavored to make their research accessible and meaningful but highlighted different dimensions of relevance.

6. Conclusion

In high-stakes contexts like the 3MT competition, where clarity, brevity, and impact are paramount, importance markers serve as cognitive, rhetorical and promotional tools. They help presenters to clarify claims, engage audiences, and emphasize the value of their research. Drawing on frame semantics, this study has developed the Importance Frame, a conceptual framework designed to capture the cognitive dynamics of how importance is communicated. The frame comprises five key elements, namely, Factor, Explanation, Degree, Undertaking, and Intrested_Party, each with its own subcategories. The application of this frame in the analysis of 120 3MT presentations has revealed that hard-discipline presenters tended to employ importance markers more frequently, offering explicit explanations and attributing importance to functional or systemic aspects of their research. In contrast, soft-discipline presenters often made implicit evaluations, emphasizing the contextual or situational significance of their work. Additionally, hard-discipline presenters were more likely to position the general public as a key stakeholder, underscoring the societal impact and broader relevance of their research. These differences reflected how presenters tailored their use of importance markers to meet the communicative expectations of their disciplines and the 3MT competition's diverse audiences. These cross-disciplinary differences notwithstanding, both hard and soft disciplines could benefit from adopting strategies favored by each other. Soft-discipline presenters might enhance their communication by incorporating more explicit importance markers, thereby making their research more accessible and engaging to broader audiences, particularly in high-stakes, public-facing contexts. Conversely, hard-discipline presenters could enrich their presentations by drawing on contextualization strategies common in soft disciplines, which highlight the societal or human relevance of research outcomes. Ultimately, a hybrid approach combining explicit importance markers with contextualization would allow presenters from

both disciplinary groups to communicate the significance of their work more effectively, fostering clearer, more engaging communication that resonates across disciplinary boundaries. By blending clarity with context, researchers can enhance both the reach and impact of their findings.

This study makes both theoretical and practical contributions to our understanding of spoken academic communication. First, the Importance Frame deepens our understanding of how importance is framed in high-stakes settings like 3MT competitions, providing a robust framework that can be applied to other academic genres, such as conference presentations, seminars, and thesis defenses. This framework will also be valuable for future studies which can explore how rhetorical strategies for marking importance vary across different contexts and individual variables, such as the presenter's gender or cultural background. Second, the study illuminates how disciplinary conventions shape rhetorical strategies, helping presenters align their messages with audience expectations and position their work within broader epistemic and societal contexts. Third, from a pedagogical standpoint, the findings provide actionable insights for academic communication training, particularly in preparing graduate students for 3MT competitions and other public-facing academic engagements. Instructors can use the Importance Frame as a tool to help students hone their rhetorical skills by analyzing how different disciplines emphasize key aspects of their research, capture audience interest, and establish the relevance of their findings. Understanding the distinct ways in which hard and soft disciplines frame importance will enable students to craft presentations that align with disciplinary norms and expectations. This approach not only enhances students' ability to communicate effectively within their fields but also fosters interdisciplinary collaboration, as it encourages students to express their research in ways that resonate across disciplines. Additionally, the findings of this study can inform curricular efforts to equip students with the strategies needed to navigate the rhetorical demands of academic presentations across a wide range of academic contexts.

Despite these contributions, this study has several limitations. The absence of presenter interviews restricts an emic understanding of the strategic intentions behind the use of importance markers. Future research could explore presenters' perspectives to gain insights into how rhetorical choices align with communicative goals. Additionally, the study did not examine audience reception, leaving an incomplete picture of how importance markers function in real-time interactions. Future studies could

address this limitation by investigating how audiences perceive and respond to evaluative strategies. Finally, this study focused exclusively on linguistic expressions, overlooking multimodal resources such as gestures, facial expressions, and visual aids. Future research could explore how these non-linguistic resources integrate with linguistic markers to provide a more comprehensive understanding of persuasive communication in academic contexts.

Appendix A

The complete list of search words used to identify importance markers

Category	Part of speech	Search word
Importance	Verb	*note, highlight, stress, emphasize, matter, count*
	Noun	*attention, concern, consequence, effect, emphasis, gravity, import, influence, magnitude, priority, relevance, sense, seriousness, significance, usefulness, value, substance, emergency, paramountcy, primacy, prominence*
	Adjective	*big, critical, crucial, essential, historic, imperative, vital, major, necessary, serious, significant, urgent, valuable, weighty, grave, material, seminal, substantial, meaningful, main, leading, chief, imperative, influential substantial, fundamental, paramount, prominent prominently, pivotal, momentous*
	Adverb	*prominently, significantly, critically, crucially, essentially fundamentally, importantly, seriously, notably*
Unimportance	Verb	*understate, belittle, neglect, ignore, overlook, disregard,*

	underestimate, lessen, bypass, trivialize
Noun	*unimportance,insignificance, littleness, triviality, worthlessness, irrelevance, marginality*
Adjective	*unimportant, inappreciable, inconsequential, uncritical, little, inconsiderable, inessential, insignificant, minor, negligible, slight, small, trifling, trivial, unnecessary, unsubstantial*
Adverb	*unimportantly, insignificantly, trivially, minimally, irrelevantly, negligibly, inconsequentially, slightly, marginally*

Appendix B

Coding scheme of frame elements.

Frame	Frame Element (Core) *	Frame Element (Non-Core) *	Example (Lexical Unit)
Importance	Factor, Undertaking, Field, Interested_party	Degree, Explanation, Frequency, Place, Time	*important*
Being_necessary	Dependent, Required_entity, Requirement	Condition, Degree, Dependent_individual, Descriptor, Domain, Explanation, Place, Time	*essential*
Usefulness	Entity, Purpose	Degree, Domain, Time	*valuable*

* Frame elements are extracted from FrameNet.

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