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Three minute thesis presentations as an academic genre: A cross-disciplinary study of genre moves

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ABSTRACT

This paper reports on a cross-disciplinary study of the rhetorical structure of Three Minute Thesis (3MT) presentations, an increasingly popular yet largely unexamined academic speech genre. The study analyzed a corpus of 142 presentations by PhD students from four disciplines chosen to operationalize two widely discussed disciplinary distinctions (i.e., hard vs. soft and pure vs. applied disciplines). The analysis identified eight distinct rhetorical moves in the 3MT presentations, including six obligatory moves (i.e., Orientation, Rationale, Purpose, Methods, Implication, and Termination) and two optional ones (i.e., Framework and Results). Further analyses revealed statistically significant associations between disciplinary affiliation and the likelihood to employ three moves (i.e., Framework, Methods, and Results). These relationships are explained in terms of the dominant epistemological codes at work in the different disciplines. The findings have important implications for graduate students, 3MT tutors, EAP instructors, and other academics involved in preparing PhD students for 3MT competitions and teaching spoken academic discourse in general.

1. Introduction

Academic communication is the life blood of academia because both knowledge making and personal reputation depend crucially on it (Becher & Trowler, 2001). While written academic discourse has traditionally been the center of research and pedagogical attention, the importance of spoken academic communication has increasingly been recognised in recent years (Hyland, 2006; Lee, 2016). There is a growing consensus that strong oral academic communication skills constitute a vital asset for both early-career and established scholars (Shaikh-Lesko, 2014). Against this backdrop has emerged a new and increasingly popular academic communication genre, Three Minute Thesis (3MT) presentations, which challenges graduate students to report their dissertation research in just 3 min to a disciplinarily heterogeneous audience following strict competition rules such as the use of only one static PPT slide. Such presentations are delivered at the fast-spreading 3MT competitions pioneered by The University of Queensland (UQ) in 2008 and now held globally in over 600 universities and institutions across some 60 countries.[1] Although 3MT presentations are delivered only by graduate students and may thus be regarded as marginal, they have been envisioned as having important educative value. As pointed out by Skrbis et al. (2010),

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[1] For details, see the official 3MT website (https://threeminutethesis.uq.edu.au/about).

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initiators of the 3MT concept, 3MT was launched as an integral part of academic oral presentation skill training for PhD/MPhil students at UQ to counter the widespread imbalance of privileging academic writing skills at the expense of spoken communication skills in higher degree programs and to better prepare graduate students for future academic or non-academic careers. In the field of EAP, the need for graduate students to communicate with non-specialist audiences was highlighted three decades ago by Huckin and Olsen (1984), and their observation "has never been more true than it is today" (Feak, 2016, p. 496). The academic genre of 3MT presentations provides impetus and opportunity for graduate students to hone their skills to communicate with non-experts and general presentational competence (Feak, 2016) and prepare for their PhD oral defense (Mežek & Swales, 2016).

Despite the exponential spread of 3MT events, a growing recognition of their important role in cultivating graduate students' communicative competence, and EAP scholars' view of 3MT as "certainly an area worthy of research attention" (Feak, 2013, p. 39), the 3MT genre has until now been ignored by genre scholars, as evidenced by the paucity of empirical research published on this genre in the field of EAP. This lack of research attention is conspicuous, considering the daunting challenges faced by graduate students to condense a colossal doctoral dissertation into a three-minute presentation and the inadequate attention to the rhetorical features of this genre in the training they may receive. Although many universities do provide preparatory workshops or coaching sessions, which are often conducted by communication instructors, the focus is typically on general public speaking tips such as showing enthusiasm for the subject, being aware of body language, and projecting one's voice (Copeman, 2015; Shaikh-Lesko, 2014). Such advice, while practical, has been criticized for being very "basic" and "superficial" (Copeman, 2015, p. 78). Thus, there is a pressing need for genre research that can contribute a better and more nuanced understanding of 3MT presentations so that genre-specific pedagogical advice can be offered to graduate students, 3MT tutors, and other academics such as EAP instructors for more effective training.

1.1. Swalesian genre analysis and previous research on spoken academic genres

The ESP approach to genre analysis developed by Swales (1990, 2004) provides a robust framework for investigating the rhetorical structure of 3MT presentations. The rhetorical structure of a genre is constituted by a series of moves and/or steps, each being "a discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse" (Swales, 2004, p. 228). Notably, a move is "a functional, not a formal, unit" (p.229) because, apart from having its own purpose, it also contributes to the unifying communicative purposes of the genre. These local and overall communicative purposes motivate and shape the genre, whose texts exhibit "various patterns of similarity in terms of structure, style, content and intended audience" (Swales, 1990, p. 58). Thus, the Swalesian approach emphasizes the primary role of communicative/rhetorical functions in identifying distinct moves/steps. Although it is applicable to both written and spoken genres, the functional approach has been widely adopted to examine the schematic structures of various written academic genres, such as research articles (Holmes, 1997; Moreno & Swales, 2018), theses/dissertations (Bunton, 1998; Kwan, 2006), student laboratory reports (Parkinson, 2017), and conference abstracts (Halleck & Connor, 2006; Payant & Hardy, 2016). By contrast, a much smaller body of EAP genre studies has taken the Swalesian approach to examine the rhetorical structures of spoken academic genres, such as PhD defenses (Mežek & Swales, 2016; Swales, 2004), conference presentations (Rowley-Jolivet & Carter-Thomas, 2005), academic lectures (Lee, 2016), and TED talks (Chang & Huang, 2015).

Of the relevant academic speech genres examined, lectures have perhaps received the most research attention. Thompson (1994) conducted a Swalesian move analysis of 18 lecture introductions sampled from several disciplines and was able to identify two distinctive rhetorical moves (i.e., Setting up Lecture Framework and Putting Topic in Context) and several steps within each move (e.g., Announcing Topic, Indicating Scope, and Showing Importance/Relevance of Topic). She also noticed the absence of a clearly preferred sequence of functional elements in the data and attributed the observed variation in sequencing to the unique communicative purposes and spontaneous nature of lectures as a pedagogic and spoken genre. Two other studies, Cheng (2012) and Lee (2009), also focused on the rhetorical structures of distinct lecture phases (i.e., introductions and closings, respectively) and examined how factors such as class size might impact on them. In a recent study, Lee (2016) combined a Swalesian move analysis of 24 EAP lessons with corpus-based methods and identified nine moves within three distinct phrases of the lessons. Some of these moves, for example, Getting Started and Bidding Farewell, can be expected to appear in 3MT presentations as well because of their commonalities with lectures as spoken genres involving an immediate audience and prizing positive interpersonal rapport. Lee also found that the rhetorical moves in each lesson phase seldom progressed in a linear sequence, corroborating Thompson's (1994) earlier finding about lecture introductions.

Apart from rhetorical structures, previous studies also investigated various linguistic features of the lecture genre. Some (e.g., Fortanet, 2004; Lee & Subtirelu, 2015) examined the use of metadiscourse in framing lectures, engendering student involvement, establishing relationships among ideas, and advancing arguments. Other studies (e.g., Biber & Barbieri, 2007; Biber, Conrad, & Cortes, 2004; Lee, 2016) uncovered how lexical bundles were used as discourse-signaling cues to structure ongoing lectures and indicate stance. There were also corpus-based studies that focused on the use of various lexicogrammatical resources in marking the relevance/importance of lecture points to engage in interactive and textual orientation (Deroey, 2012, 2014, 2015) and the deployment of attitudinal language in expressing explicit evaluation (Bellés-Fortuño, 2016, 2018). Contrastive analyses of these lexicogrammatical resources in lectures revealed that they varied across disciplines (Deroey, 2012) and across different languages (Bellés-Fortuño, 2016). In connection with the analytic approach adopted in the present study, it is important to point out that although some linguistic features index communicative intentions and consequently tend to co-occur in certain rhetorical moves, they can only assist in, rather than constitute the

primary basis for, the identification of these moves. This stems from the fact that moves are functional rather than formal units of discourse and that their identification must therefore rely primarily on the delineation of their communicative purposes (Kwan, 2006; Moreno & Swales, 2018).

Another spoken academic genre, conference presentations, deserves attention here because of its apparent similarities with the 3MT genre; that is, both are carefully prepared presentations delivered to a live audience to disseminate research and subject to constraints of information processing in real time. Although Dubois's (1980) pioneering work investigated the schematic structure of biomedical conference presentations in the early 1980s, it was only 20 years later that the genre began to receive some focused attention. Arguing for the value of a genre-based approach to understanding conference presentations and the importance of equipping novice presenters with generic knowledge, Ventola (2002) proposed a generic structure for conference presentations and stressed the need to identify generic variations of such presentations in cross-linguistic and cross-cultural contexts. Seeing the need for novice academics to deploy moves valued in their disciplinary communities, Shalom (2002) compared conference presentations by novice and established applied linguists and found a marked difference in the use of a move named "contextualizing the paper". Analysing interrelated conference genres (e.g., conference presentations, their related published papers, and conference abstracts), Räisänen (2002) demonstrated that conference genres are a mixture of oral and written genres that have different communicative purposes and rhetorical characteristics. Thus, to gain entry to conference forums, novice academics require situated knowledge of the different genres to make sense of the discursive practices of their disciplines. Drawing on a corpus of 90 conference presentations from three disciplines, Rowley-Jolivet (2002) found that the reporting of novel and typically preliminary results in conference presentations clearly positioned the genre at an early stage of a multi-staged knowledge-making process and that there were "significant differences between the three fields studied, related to their different research methods and deontologies" (p.112). Of particular relevance to the present study is Rowley-Jolivet and Carter-Thomas's (2005) genre analysis of the introductions of 44 conference presentations from three science disciplines that identified a three-move structure: Setting up the Framework, Contextualizing the Framework, and Stating the Research Rationale. This move structure was compared with three previous move models of academic introductions (Dubois, 1980; Swales, 1990; Thompson, 1994) in spoken (conference presentations and university lectures) and written (research article introductions) genres. The comparison revealed that introductions of conference presentations are "related in certain aspects to introductions in other academic genres" but create "a fresh synthesis" (p.56) of rhetorical features.

Several studies have forayed into spoken student genres. Swales, Barks, Ostermann, and Simpson (2001) analyzed architecture presentations (also known as crits or design reviews) given by graduate students for assessment purposes and identified three major moves (i.e., Site Description, Architecturally Contextualized Rationale, and Design Details) in the genre. Furthermore, the researchers found that successful presenters managed the flow of the three moves judiciously and drew on various rhetorical and lexicogrammatical resources (e.g., functional description and the present tense) to make their project real and experienceable. These findings were largely corroborated by Morton's (2009) study of architecture presentations by undergraduate students, which revealed successful presenters' effective use of narratives and other resources to establish their credibility as designers, draw the audience into their own worlds, and manage the moves effectively to contextualize their designs. In another study of successful student presentations, Zareva (2013) found that TESOL graduate students' projection of their identity roles was heavily influenced by and resembled the written academic genres (e.g., book chapters and articles) that they consulted for the presentations. This finding was consistent with what Weissberg (1993) discovered in his examination of graduate seminars presented by students to a disciplinary audience, including departmental faculty, academic guests, and peers: The structure of such seminars, be they PhD proposals, in-progress reports or reports of finished research, usually followed the typical Introduction-Method-Results-Discussion format of the research article, with the Results component absent from the first two types of seminar for an obvious reason.

The PhD defense is another oral academic genre that focally involves students and is perhaps the closest to the 3MT presentation in terms of their dependence on the written PhD dissertation. Both genres provide opportunities for graduate students to communicate their PhD work and demonstrate their scholarly prowess to an authoritative panel (i.e., examiners and 3MT judges) and an academic audience (e.g., faculty and fellow PhD students). Hence, a review of extant research on PhD defenses is in order. In one of the earliest genre studies of PhD defences, Hasan (1994) drew on systemic functional linguistics and proposed, based on a close analysis of a sociology PhD examination at a US university, a 14-stage inventory depicting the generic structure potential of the genre since not all the stages will necessarily occur in a single PhD defense. Examining the same sociology PhD defense, Grimshaw, Feld, and Jenness (1994) identified four major segments of a typical defense: the opening segment, the defense proper, the in camera segment, and the closing segment. Each of these segments comprised several moves; for example, the opening segment consisted of settling in, the chair's statement of procedures, the candidate's brief narrative, and his/her summary of the doctoral project and its principal findings. Swales (2004) examined the generic structure of four PhD defences in different disciplines at another US university and found that Grimshaw et al.'s 4-segment structure, with some rearrangement of the constituent parts, captured the structural movement of the defences well. More recently, Mežek and Swales (2016) surveyed research on PhD defenses in different educational contexts and found both differences and similarities in the generic structures of the defenses. As an illustration, while defences in the US, Iran, and Norway follow the aforementioned generic structure identified by Swales (2004), those in Belgium and The Netherlands have an additional segment called "laudatio", where the supervisor praises the candidate for his/her academic achievements. There are also disciplinary differences; for example, at Swedish universities, a thesis summary is provided as part of the defense proper by the candidate in the natural sciences but by the examiner in the humanities and social sciences.

To sum up, the above review of research on academic speech genres has demonstrated the value of a Swalesian move analysis as a robust and powerful tool for investigating and gaining insight into how "the communicative purpose of a genre (a 'privileged' criterion) shapes the genre and provides it with an internal structure – a schematic structure" (Askehave & Swales, 2001, p. 198). The review has also revealed that academic speech genres are not "pure" or "isolated" genres but draw on and repurpose generic resources from related genres, both written and spoken, in new communicative contexts. Such generic repurposing, known as interdiscursivity, is further discussed below.

1.2. Interdiscursivity and 3MT presentations

Interdiscursivity recognizes the complex and interrelated nature of genres, as reflected in the mixing of different genres to create genres in response to new communicative purposes and contexts (Bhatia, 2004; Hyland, 2009). The role of interdiscursivity in the development of new genres has long been acknowledged. As Todorov and Berrong (1976) point out, "a new genre is always the transformation of one or several old genres: by inversion, by displacement, by combination" (p.161). As a discursive practice, interdiscursivity is pervasive in the professional and academic worlds and can be observed in both written and spoken genres. Bhatia (2004), for example, demonstrates how various written genres (e.g., corporate annual reports, job descriptions, and book reviews) blend generic resources and rhetorical features from different sources. By the same token, spoken genres, such as conference presentations (Hyland, 2009), seminars (Aguilar, 2004), poster presentations (MacIntosh-Murry, 2007), and TED talks (Caliendo, 2014), have also been found to incorporate a range of generic conventions and rhetorical strategies to create genre-specific syntheses and respond to unique communicative needs. Notably, such cross-genre borrowings do not just occur within the same semiotic modes (e.g., written or spoken) but also between different modes (for examples see Aguilar, 2004; Caliendo, 2014; Hyland, 2009; MacIntosh-Murray, 2007).

There is good reason to expect interdiscursivity to occur in the 3MT genre, given the many similarities it shares with the genres discussed above and in view of the three key factors suggested by Bhatia (1999) for genre identification/characterization, viz., "the rhetorical context in which the genre is situated, the communicative purpose(s) it tends to serve, and the cognitive structure that it is meant to represent" (p.23). As regards the rhetorical context, 3MT presentations are situated in academic settings and center around the communication of doctoral research to a live audience. Thus, the genre resembles other oral academic genres (e.g., seminars, lectures, and conference presentations) in the necessity of attending to the needs of the audience and working under constraints of real-time information processing by adopting similar rhetorical strategies such as establishing interpersonal rapport and providing an orienting framework upfront. Unlike most other academic genres, however, it draws a disciplinarily heterogeneous audience and is staged in competition before a judging panel that rates individual presentations according to common and stringent criteria on content, performance, duration, and visual aids.[2] The competitive nature of the genre means that 3MT presentations are carefully scripted and well rehearsed for peak performance to impress the judges. Consequently, the 3MT genre is a highly institutionalized and unique response to a novel rhetorical context. As for its communicative purposes, the 3MT genre has been created to disseminate and promote PhD research. As such, it belongs to a genre set that doctoral students engage in as part of their disciplinary enculturation and research training. Other members of this public research-process genre set include spoken genres such as conference/poster presentations, graduate seminars, and PhD defenses as well as written ones such as research articles, conference abstracts, and dissertations (Swales, 1990; Zareva, 2013). Given its communicative purposes and interdiscursive linkages with other public research-process genres, the 3MT genre can be expected to incorporate some of the generic moves (e.g., Introduction, Method, Results, and Discussion) that have been found to characterize the other research presentation genres to create its own cognitive structure, namely its generic patterning.

The hybrid nature of the 3MT genre, however, does not preclude the value of investigating its rhetorical structure. Although 3MT presentations are likely to draw on generic features from other academic genres, as Rowley-Jolivet and Carter-Thomas (2005) found in their study of conference presentations, such interdiscursive borrowings can be expected to combine generic resources in a genre-specific structure. Thus, there is a need to uncover this genre-specific structure and its variation across contexts of use. One likely source of such variation is disciplinary influences.

1.3. Disciplinary influences on academic genres

Based on his review of research on several spoken academic genres, Swales (2004) concluded that disciplinary differences often reported in the academic writing literature were not evident in academic speech. He attributed what he saw as "a considerably greater homogeneity in oral performance" in part to the prevalence of a levelling "open style" (p.205). The research reviewed above, however, is indicative of disciplinary influences on academic speech genres, including student presentations and PhD defenses. Both Zareva (2013) and Weissberg (1993), for example, found that student presentations followed the typical structures of written academic genres, suggesting the existence of disciplinary influences because such differences have been observed in these written genres. Morton's (2009) study of student architecture presentations revealed that successful presentations were able to apply rhetorical strategies invested with disciplinary norms and valued by disciplinary experts. Similarly, the generic organization and semiotic media (e.g., drawings and models) of the presentations

[2] The competition rules and judging criteria can be found at https://threeminutethesis.uq.edu.au.

examined made them immediately recognizable as a discipline-specific student presentation genre. Mežek and Swales (2016) also noted some disciplinary differences in PhD defences at Swedish and UK universities. In view of the many similarities that 3MT shares with student presentations and PhD defenses, there is a need to study potential disciplinary influences on the 3MT genre, that is, how 3MT presentations "package information in ways that conform to a discipline's norms, values, and ideology" (Berkenkotter & Huckin, 1995, p. 1).

Much extant research on disciplinary rhetorical and linguistic variation has drawn on Becher's (1989) two-way typological classification of disciplines into hard (e.g., biology) vs. soft (e.g., education) and pure (e.g., history) vs. applied (e.g., mechanical engineering) ones. For example, this line of research has considered the influences of hard and soft disciplines on the move structures of written genres such as abstracts (Hyland, 2000; Jiang & Hyland, 2017) and thesis abstracts (Bunton, 1998). Although disciplinary variation in written academic genres has been well established, fewer studies have looked into spoken academic genres from a disciplinary perspective, especially in terms of variation in move structures. The few extant studies (e.g., Chang, 2012; Simpson-Vlach, 2006) that we have located focused mainly on disciplinary variation in the use of lexicogrammatical features. For instance, Simpson-Vlach (2006) confirmed the variation pattern in the use of hedges by hard and soft disciplines found in Hyland's (1998) study of written discourse. The paucity of cross-disciplinary studies of academic speech genres means that the extent and nature of disciplinary variation in these genres remain to be examined. Thus, to address the research lacuna, the present study examines to what extent disciplinary variation exists in the schematic structure of 3MT.

In contrast to the extensive body of research comparing hard and soft disciplines in generic and linguistic variation, much fewer studies have been conducted to compare pure and applied fields. However, extant scholarship did uncover interesting differences between the two disciplinary groupings. For example, Nesi and Gardner (2006) found that undergraduate writing tasks in applied disciplines tended to place a greater emphasis on practical relevance, knowledge application and the practice-theory nexus than their counterparts in pure disciplines did. Examining the generic structure of doctoral dissertations, Ridley (2000) observed a difference between pure and applied disciplines: While most dissertations from pure sciences adopted an article-compilation dissertation format, only a few engineering dissertations followed this structure.[3] Given the small number of extant studies, further research is needed to produce insights into what generic differences exist between pure and applied disciplines and how they may relate to the epistemological characteristics of these disciplines. The present study is an effort along this line.

Recently, cross-disciplinary variation in academic literacy practices has also been examined within a knowledge-knower framework (Maton, 2000, 2014) that distinguishes disciplines by their prevalent epistemological orientations. Two of these epistemological orientations are known as a knowledge code and a knower code. Disciplines dominated by a knowledge code have a more structured hierarchical body of knowledge that is verified against established scientific principles and procedures (Maton, 2014). In such disciplines, the backgrounds of the scientists or "knowers" are largely irrelevant to knowledge making. By contrast, disciplines operating with a knower code depend more on the distinct individual characteristics of academics constructing disciplinary knowledge. Knowledge claims tend to be legitimated by appealing to knowers' personal voice, expertise, experience, and authority. The explanatory power of the knowledge-knower framework has been testified in recent cross-disciplinary variation studies such as Hood (2011) on citation practices and Hu and Cao (2015) on metadiscourse in research articles. For instance, Hu and Cao found that in their corpus the applied linguistics and education research articles, with a stronger knower code, employed boosters more frequently than psychology ones, displaying a stronger knowledge code, because such devices enabled them to increase their commitment to their knowledge claims, assert authority, and position themselves as legitimate knowers. Existing research indicates that the knowledge-knower code orientations prevailing in different disciplines can be a useful explanatory framework for identifying and interpreting disciplinary influences on academic discourse. However, more empirical work is needed to understand how the epistemological orientation of a discipline influences the rhetorical structure of its academic genres, including spoken genres such as 3MT presentations.

The research reviewed above has pointed to a dearth of genre studies on 3MT presentations. Given the envisioned educative value of this genre (Feak, 2016; Skrbis et al., 2010), there is a need for research that draws on a large corpus of representative 3MT presentations from multiple disciplines to identify the schematic structure of the genre reliably and to describe its cross-disciplinary variation accurately. Such a generic knowledge can provide meaningful and appropriate support to graduate students who are interested or need to make 3MT presentations. Thus, this study aims to establish the rhetorical moves of the 3MT genre and their instantiation across broad disciplinary groupings (i.e., hard/soft and pure/applied) to explore factors shaping generic variation. Specifically, we address the following research questions:

1. What rhetorical moves can be found in 3MT presentations?
2. Is there any systematic generic variation in 3MT presentations from different disciplines?

2. Method

2.1. The corpus

To answer the research questions, a corpus was constructed to include 142 3MT presentations delivered between 2010 and 2016 by PhD students coming from over 70 universities across the world and four different disciplines – Biological Sciences,

[3] As one reviewer points out, the difference observed by Ridley 17 years ago is gone at many universities.

Table 1
Number of 3MT presentations by discipline and winning status.

Winning status	Hard discipline		Soft discipline		Total
	Biological Sciences	Mechanical Engineering	Education	History	
Award-winning	20	20	20	11	71
Non-winning	20	20	20	11	71
Total	40	40	40	22	142

Mechanical Engineering, Education, and History. These disciplines, representing natural science, technology, social sciences and humanities, were chosen to operationalize two broad disciplinary distinctions: hard vs. soft and pure vs. applied. Following Becher's (1989) typology, Biological Sciences and Mechanical Engineering were selected as hard disciplines, and Education and History as soft ones. Biological Sciences and History were also chosen to represent pure disciplines, and Mechanical Engineering and Education applied ones. The broad groupings of hard vs. soft and pure vs. applied disciplines were followed because they are the traditional divisions of academic scholarship and are widely adopted in current cross-disciplinary variation studies (e.g., Gao, 2016; Hu & Wang, 2014; Jiang & Hyland, 2017). The four specific disciplines were sampled not only because they are established representatives of their respective disciplinary groupings and thus have often been selected in genre studies (e.g., Hyland, 2000), but also because they were found in our pilot study to have the largest number of 3MT presentations available on the Internet. In addition to the disciplinary groupings, an equal number of award-winning and non-winning finalists' presentations in each of the four selected disciplines were included to investigate intra-disciplinary variation. As summarized in Table 1, our corpus comprised 8 parallel sub-corpora, each with 20 presentations except for History, which had 11 award-winning and 11 non-winning presentations. The descriptive statistics presented in Table 2 show that the whole corpus totalled 62532 words, with the shortest and the longest presentation running 273 and 646 words, respectively.

Relevant video data were collected in 2016 from public domains – YouTube, Vimeo, threeminutethesis.org and university websites – using search terms such as "3MT," "three minute thesis," "3MT/three minute thesis + biology," "3MT/three minute thesis + mechanical engineering," "3MT/three minute thesis + education," and "3MT/three minute thesis + history." Following the guidelines of representativeness, balance and homogeneity for building a spoken corpus as proposed by Adolphs and Carter (2013), specific data inclusion criteria were worked out, as follows.[4]

The first criterion was that the presentations followed the core 3MT rules set by UQ, including the 3-min presentation time limit, the use of a single static PowerPoint slide, and the banning of any props. This was to ensure that the presentations included in our corpus exemplified the important features of the genre. For instance, rules regarding the use of slides and props separate it from other similar academic research communication genres (e.g., conference presentations, TED talks) and other science communication competitions (e.g., FameLab). These rules force presenters to rely on spoken language rather than non-verbal means and thus make 3MT presentations ideal for genre analysis. The second criterion was that the presenters were PhD students, their presentations were delivered at university-wide final competitions or higher-level contests, and the winning status (i.e., winner, runner-up, and third place, as determined by judging panels rather than audience votes) of the presentations could be determined. This was to enhance the representativeness and homogeneity of the presentations, and the comparability of the sub-corpora. The last criterion used to screen data was that the presentations were given by PhD students affiliated with the four chosen disciplines and had discipline-relevant content. This was to exclude those presentations falling outside the four focal disciplines, hence ensuring the disciplinary representativeness and homogeneity of the corpus.

The application of the aforementioned inclusion criteria resulted in a pool of 212 presentations from the four disciplines by both award-winners and non-winning finalists. Using the method of stratified random sampling, we selected 20 presentations from each discipline and winning category, except for the two History sub-corpora and the award-winning sub-corpus of Mechanical Engineering. For History, only 11 award-winning and 11 non-winning presentations had been found by the end of data collection, and in the case of Mechanical Engineering, exactly 20 award-winning presentations had been located and were all included in the sub-corpus. This sampling process resulted in a corpus of 142 3MT presentation videos. All the videos were transcribed verbatim. Two native speakers of English – one being a PhD candidate and a 3MT winner, and the other with a Master's degree – audit-checked against the video recordings 38% ($n = 54$) of the transcripts. The remaining transcripts were audit-checked at least twice by one of us. The 142 transcripts were then transported into MAXQDA version 12.1 (2016) for further analysis. The mixed-methods data analysis software allowed us to segment and annotate the transcriptions with a self-created coding scheme and to count and retrieve the coded segments.

2.2. Data coding and analysis

The Swalesian analytic approach was drawn upon in this study to identify the moves of the sampled 3MT presentations. To analyze the data, we followed the steps recommended by Biber, Connor, and Upton (2007, p. 34) for conducting a corpus-

[4] Language background (i.e., native/non-native English speaking) was not used as a criterion for two reasons. First, such information was not publicly available. Second, as the presenters included in our corpus were all finalists, they were highly proficient in English and showed no apparent language difficulties, regardless of language background.

Table 2
Descriptive statistics for the corpus.

	No. of presentations	Min. no. of words	Max. no. of words	*M*	*SD*	Total words
Hard disciplines	80	273	646	446	74.12	35709
Soft disciplines	62	314	551	433	58.44	26823
Pure disciplines	62	344	646	458	59.18	28424
Applied disciplines	80	273	569	426	71.10	34108
Award-winning	71	280	603	452	59.46	32085
Non-winning	71	273	646	429	73.93	30447
Total	142	273	646	440	67.84	62532

based move analysis. First, the 3MT guidelines available on the official 3MT website (https://threeminutethesis.uq.edu.au/home) and relevant sources (e.g., Shaikh-Lesko, 2014; Skrbis et al., 2010) were consulted to identify the overall communicative purposes of the 3MT genre. Second, the afore-mentioned judging criteria on the content of 3MT presentations were used to identify an initial list of rhetorical functions of text segments and types of moves. These two steps are crucial to the Swalesian approach to move identification because in this approach moves are functional units of a text that simultaneously serve their local rhetorical functions and contribute to the overall communicative purposes of the text. By making explicit such rhetorical functions and communicative purposes, the guidelines and judging criteria point to expected generic moves. For example, the judging criterion of "Did the presentation provide an understanding of the background and significance to the research question being addressed … ?" suggests two moves that are expected to serve the local rhetorical functions of providing a content orientation and a research rationale, respectively, and contribute to the overarching purposes of disseminating and promoting one's doctoral research. Third, in view of the widely observed phenomenon of interdiscursivity in academic genres discussed earlier and because of the presumably hybrid nature of the 3MT genre, another list of potential move types was identified in the literature on relevant written academic genres (e.g., Bunton, 1998; Halleck & Connor, 2006; Hyland, 2000) and spoken ones (e.g., Chang & Huang, 2015; Lee, 2016; Rowley-Jolivet & Carter-Thomas, 2005; Weissberg, 1993). Fourth, a tentative coding scheme was developed by combining the two lists of move types obtained at Steps 2–3 and used in pilot coding to test its adequacy. The coding scheme was iteratively revised and fine-tuned as discrepancies were revealed and new move categories emerged. Based on the results of the pilot coding, a full coding scheme was developed to include clear definitions and examples of eight move types.

Next, inter-coder reliability check was conducted before the coding scheme was finalized to establish coding reliability and validity. One of us and a graduate student familiar with Swalesian move analysis independently coded 11% ($n = 16$) of presentations in the corpus, that is, two presentations randomly selected from each sub-corpus. Prior to coding, training was provided to familiarize the second coder with the definitions of the moves, prototypical move examples, and textual boundary indicators. Cohen's Kappa coefficient (0.74) indicated good inter-coder agreement (Hartmann, 1977). Disagreements about individual cases were resolved through discussion, which led to further refinements of the coding scheme and a re-coding of the relevant moves. Since satisfactory coding reliability was established, the finalized coding scheme was used by one of us to code the remaining presentations in the corpus.

To answer the first research question, all the rhetorical moves in the corpus were identified, and the coded moves were tallied by type and sub-corpus. Percentages of move occurrences were derived for the sub-corpora as well as the whole corpus. Based on these percentages, obligatory and optional moves were identified to provide an overall picture of the generic structure of 3MT presentations. Following previous studies (e.g., Halleck & Connor, 2006), the cut-off point for an obligatory move was set at 80%: A move was classified as obligatory when present in 80% or more of the presentations and optional when appearing in fewer presentations.

To answer the second research question about systematic generic variation, eight direct logistic regression analyses were performed on the data using SPSS 22.0. Logistic regression is appropriate when the purpose is to evaluate the relationship between dichotomous predicator variables and categorical outcome variables (Field, 2009). The outcome variable was presence of a move type in a presentation, and the predictor variables were the two disciplinary distinctions and the winning status of the presentations. The last predictor variable was included in our preliminary analyses because it was reasoned that award-winning and non-winning presentations might reflect disciplinary epistemological practices to different extents. This possibility was investigated but no difference was found; therefore, the winning/non-winning variable was excluded from the eight logistic regression analyses reported below. The alpha was set at 0.05 for all the statistical tests to determine if the results obtained were statistically significant. Nagelkerke R^2 and odds ratios, which index the amount of variance explained by predictors, were used to measure the magnitude of the associations observed.

3. Results

The presentation of the results in this section is organized according to the research questions. In response to the first research question, Section 3.1 presents the eight moves identified in the corpus and illustrate them with examples from the corpus. Section 3.2 reports the results of the logistic regression analyses in relation to the second research question. For ease of reference, move types are numbered and highlighted in bold, and key linguistic indicators of moves are also boldfaced in

the excerpts. It should be noted that the numbering of the move types does not suggest a linear ordering of the moves because, as often reported, moves tend to occur recursively.

3.1. The move structure of 3MT presentations

Move 1: Orientation includes listener orientation and content orientation. While the former signals the start of a presentation and engages the audience's attention, often by greeting the audience or giving a self-introduction, the latter introduces the topic and provides background information to prepare the audience for the next move. In the following examples, the speakers addressed the audience either formally (example 1) or casually (example 2) before moving on to introduce the topic or the objective of the presentation. **Orientation** was the most frequently used move in the corpus as it occurred in over 97% of the presentations.

(1) ***Ladies and gentlemen!*** *Today I want to talk to all of you about thousands of robots right across the world that want to make your lives better.* (MW14)[5]
(2) ***Hi!*** *I think it's a reasonable assumption that for the majority of you ants don't feature particularly highly on your list of priorities. Well, during the next 3 min I'd like to try change that.* (BN1)

Move 2: Rationale directly states the motivation of the research, which functions to convince the audience of the relevance or usefulness of the presented research in addressing gaps, problems, and needs in the real or research world. This is one main communicative purpose of 3MT presentations. Typical linguistic indicators used in this move include *unfortunately*, *little*, *a lack of research*, as illustrated by examples 3 and 4. **Rationale** was also an obligatory move as it occurred in over 91% of the presentations.

(3) ***Unfortunately, we know very little.*** *But one thing we do not expect … on the other hand, people with other disease also produce the protein, but somehow they don't stick together and form plug.* ***We do not fully know why****.* (BW1)
(4) *Despite the fact this order very carefully documented their activities in the Hospitaller Archive …* ***there's been a lack of research*** *on this topic and* ***a lack of consideration*** *for the* ***significance*** *of these developments.* (HN1)

Move 3: Framework allows presenters to set out a theoretical position, model or framework that was adopted as a basis for their research prior to the collection and analysis of their data. In example 5, the classification criteria for lek breeding species were clearly laid out before their category membership was determined based on the proposed criteria. The same is true for example 6, where the theoretical framework was presented at the very beginning and later used as a basis for interpreting results.

(5) *To classify species as a lek breeder, there's* ***four criteria*** *that have to be met. And I use some analogies in human behaviour to help explain them.* ***The first*** *is ….* (BW2)
(6) *My research is founded upon* ***a theory called Activity Theory*** *and activity theory simply tells me that human beings create or adopt tools to ….* (EW2)

Contrary to **Orientation** and **Rationale, Framework** was the least frequent move, appearing only in less than 6% of the presentations.

Move 4: Purpose aims to state research objectives, purposes or focus of the study, and/or specific research questions. It was often clearly marked by expressions such as *the purpose of my research* (example 7), direct questions (example 8), and *my doctoral research focuses on* (example 9). **Purpose** appeared in 81% of the presentations and thus was an obligatory move.

(7) ***The purpose of my research*** *is to investigate individual feeding strategies in seabirds ….* (BN4)
(8) ***The big question that we want to know*** *is how effective are these reading programs for these struggling readers, considering their limited resources.* (EN4)
(9) *And* ***my doctoral research focuses on*** *how the personal and ideological convictions ….* (HW10)

Move 5: Methods was also an obligatory move, occurring in over 83% of the presentations. It is employed by 3MT presenters to inform the audience of how the research is/was undertaken, often by describing the materials used, such as a model species (example 10), and the technology adopted (example 11). Just as an academic writer needs to justify his/her methodology, the 3MT presenters in the corpus often justified why a certain material, method or approach was chosen, as illustrated in examples 10 and 12.

[5] The 3MT presentations in our corpus were coded as follows: B = Biological Sciences, E = Education, E = History, M = Mechanical Engineering, N = non-award winning, W = award winning. A number (1–20) after the letters indicates the sequence of the presentation in the sub-corpus.

(10) *Now, to do this, I use **the common model species**, the Trinidadian Guppy. The Trinidadian Guppy is **commonly used in studies** of evolution and mate choice. It is a highly social and promiscuous freshwater fish and **that's what makes it so good** for answering my question about the audience effect.* (BN2)
(11) *How I am doing this? **By a new combustion technology** called MILD or flameless combustion.* (MN2)
(12) *Now historians have tended to use adults' reflective sources such as autobiographies and memoirs to tell us about childhood, **but I argue that we really need to use and hear the children's voices. So I use hundreds of evacuee letters** in my work.* (HN10)

Move 6: Results was optional because it appeared only in 57% of the presentations. As used in the corpus, **Results** informs the audience of what has been found so far or what is expected to come out of the research. Typically, the move was signalled by *what I found* (example 13), *my finding shows* (example 14), and *as a result* (example 15).

(13) *And **what I found** is that where catalase's present, less hydrogen peroxide is produced, causing less damage to the host.* (BN11)
(14) ***My findings show** that drama can facilitate the reading in at least three ways.* (EN09)
(15) ***As a result, I've discovered** that guerrilla warfare is not chaotic ….* (HW7)

As an obligatory move present in over 86% of the presentations, **Move 7: Implication** functions to draw conclusions**,** discuss the implications, significance and contributions of the reported research, or offer recommendations. The general communicative purpose of this move is to answer the question of "So what? Why is the research important?". The move was often signalled by linguistic indicators such as *it is important that* (example 16) to offer recommendations and *ultimately* (example 17) to preface a discussion of research significance or contributions.

(16) *My research shows that **it is very important** to encourage parents to read to the children…. And my research also shows that **it's very important** that teachers use diverse strategies to teach vocabulary to young children.* (EW9)
(17) *And **ultimately** with this dummy, vehicle manufactures can design safer cars and take a deep bite out of this 7500 people that dies each year in US from rollover crashes.* (MW18)

Move 8: Termination serves to end presentations by thanking the audience with a simple expression (example 18) or in a more elaborate way (example 19). Some presenters in our corpus also chose to pose questions to the audience to stimulate their thought or create some kind of suspension (example 20) before ending their presentations. Like the opening move of **Orientation**, **Termination** was an obligatory move, present in about 85% of the presentations.

(18) *Thanks!* (BN7)
(19) *I thank you kindly for your patience and kindness!* (EN10)
(20) *So, do you want to know what the penny in your pocket will be worth tomorrow? Thank you.* (HN6)

To sum up, the present study identified eight distinct move types in our corpus (see Table 3). The 3MT presentations generally began by greeting the audience, announcing the topic, and/or providing background information before moving on to state the motivation of the research. Then the research objectives, purposes or focus of the study were clearly laid out, sometimes with a theoretical model or framework provided. Next the research methods adopted in the reported research would be described and justified. More often than not, the research findings were presented, but typically the implications of the research would be spelt out in the form of significance, contributions, or recommendations. Finally, the presentations would end with an expression of appreciation to the audience. Notably, the eight moves did not appear in every presentation.

Table 3
Descriptive statistics by move and discipline.

Move	Hard Discipline				Soft Discipline				Total	
	Pure		Applied		Pure		Applied			
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Orientation	40	100.00	39	97.50	21	95.45	39	97.50	139	97.89
Rationale	37	92.50	38	95.00	18	81.82	37	92.50	130	91.55
Framework	1	2.50	0	0.00	1	4.55	6	15.00	8	5.63
Purpose	35	87.50	29	72.50	18	81.82	33	82.50	115	80.99
Methods	38	95.00	38	95.00	12	54.55	31	77.50	119	83.80
Results	29	72.50	13	32.50	15	68.18	24	60.00	81	57.04
Implication	35	87.50	34	85.00	18	81.82	36	90.00	123	86.62
Termination	34	85.00	35	87.50	20	90.91	31	77.50	120	84.51

Note. n refers to the number of presentations that contained a particular move. The percentages are derived by dividing presentations containing a move by all presentations in a particular category.

Table 4
Results of logistic regression analyses run on Moves 1 and 2.

Predictor	*B*	*SE*	*Wald*	*p*	Odds ratio (OR)	95% CI for OR	
						Lower	Upper
Move 1: Orientation							
Hard vs. Soft	0.92	1.25	0.55	.459	2.52	0.22	29.10
Pure vs. Applied	0.31	1.25	0.06	.801	1.37	0.12	15.88
(Constant)	3.30	0.81	16.78				
Move 2: Rationale							
Hard vs. Soft	0.77	0.62	1.51	.219	2.16	0.63	7.32
Pure vs. Applied	−0.77	0.62	1.51	.219	0.46	0.14	1.58
(Constant)	2.39	0.51	21.98				

Move 1: $R^2 = .005$ (Cox & Snell); $R^2 = .027$ (Nagelkerke); Model $\chi^2(2) = 0.722$, $p = .697$.
Move 2: $R^2 = .019$ (Cox & Snell); $R^2 = .043$ (Nagelkerke); Model $\chi^2(2) = 2.682$, $p = .262$.

In fact, some moves (e.g., **Framework**) were infrequent, but when they did occur, they performed important communicative functions and warranted recognition as distinct moves.

3.2. Generic variation

To determine if systematic generic variation existed in the 3MT presentations, logistic regression analyses were performed on the coded moves. Table 4 presents results of the logistic regression analyses run on the **Orientation** and **Rationale** data. A comparison between the full model with the three predictors and the constant-only model produced non-significant χ^2 values. These results indicated that the presence or absence of the **Orientation** and **Rationale** moves was not systematically associated with either of the two disciplinary distinctions.

The logistic regression analysis run on the **Framework** move found a statistically significant difference between the full model and the constant-only model, indicating that the two predictors as a group reliably distinguished the presence of the move (see Table 5). As indicated by Nagelkerke R^2, the full model explained 15% of the variance in the outcome variable, registering a medium effect size (Cohen, 1988). Ward statistics showed that only the variable of hard vs. soft disciplines was a statistically significant predictor of the presence of **Framework**. Following the advice of Tabachnick and Fidell (2007), the odds ratio was examined as another effect size measure. The odds statistic indicated that presentations from the soft disciplines were 9.09 times more likely than those from the hard disciplines to employ the **Framework** move. By contrast, no significant associations were identified for the **Purpose** move.

Remarkably, a much stronger association was found between the variable of hard vs. soft disciplines and the presence of the **Methods** move (see Table 6). Nagelkerke R^2 indicated that the full model accounted for 22.6% of the variance in the outcome variable. While this was still a medium effect size, it was about the largest effect size achievable given the present sample size ($N = 142$) and the number of predictors, as suggested by Miles and Shevlin (2001). The odds ratio of 9.89 indicated that presentations from the hard disciplines were nearly ten times more likely than those from the soft disciplines to employ a **Methods** move.

The results of the logistic regression on the **Results** move, as summarized in the lower part of Table 6, located a statistically significant relationship between the variable of pure vs. applied disciplines and the incidence of the move. The full model accounted for 10.8% of the variance in the outcome variable. The Wald statistic and odds ratio indicated that the **Results** move was significantly more likely (i.e., 3.19 times) to appear in the presentations from the pure disciplines than those from the applied disciplines.

Lastly, as shown in Table 7, the two logistic regression analyses run respectively on the **Implication** or **Termination** moves did not yield any significant χ^2 values, indicating that none of the predictor variables was significantly associated with the presence of these two move types in the 3MT presentations.

Table 5
Results of logistic regression analyses run on Moves 3 and 4.

Predictor	*B*	*SE*	*Wald*	*p*	Odds ratio (OR)	95 % CI for OR	
						Lower	Upper
Move 3: Framework							
Hard vs. Soft	−2.23	1.09	4.20	.040	0.11	0.01	0.91
Pure vs. Applied	−0.64	0.85	0.57	.452	0.53	0.10	2.80
(Constant)	−1.87	0.46	16.86				
Move 4: Purpose							
Hard vs. Soft	−0.23	0.44	0.27	.603	0.80	0.34	1.89
Pure vs. Applied	0.57	0.45	1.58	.209	1.77	0.73	4.31
(Constant)	1.36	0.36	14.47				

Move 3: $R^2 = .053$ (Cox & Snell); $R^2 = .150$ (Nagelkerke); Model χ^2 (2) = 7.707, $p = .021$.
Move 4: $R^2 = .012$ (Cox & Snell); $R^2 = .020$ (Nagelkerke); Model χ^2 (2) = 1.749, $p = .417$.

Table 6
Results of logistic regression analyses run on Moves 5 and 6.

					Odds ratio (OR)	95 % CI for OR	
Predictor	*B*	*SE*	*Wald*	*p*		Lower	Upper
Move 5: Methods							
Hard vs. Soft	2.29	0.60	14.58	.000	9.89	3.05	32.06
Pure vs. Applied	−0.82	0.50	2.61	.106	0.44	0.17	1.19
(Constant)	1.13	0.35	10.39				
Move 6: Results							
Hard vs. Soft	−0.63	0.37	2.99	.084	0.53	0.26	1.09
Pure vs. Applied	1.16	0.37	9.77	.002	3.19	1.54	6.60
(Constant)	0.16	0.29	0.32				

Move 5: $R^2 = .133$ (Cox & Snell); $R^2 = .226$ (Nagelkerke); Model χ^2 (2) = 20.266, $p < .001$.
Move 6: $R^2 = .081$ (Cox & Snell); $R^2 = .108$ (Nagelkerke); Model χ^2 (2) = 11.941, $p = .003$.

Table 7
Results of logistic regression analyses run on Moves 7 and 8.

					Odds ratio (OR)	95 % CI for OR	
Predictor	*B*	*SE*	*Wald*	*p*		Lower	Upper
Move 7: Implication							
Hard vs. Soft	−0.05	0.50	0.01	.922	0.95	0.35	2.56
Pure vs. Applied	−0.17	0.50	0.11	.740	0.85	0.32	2.26
(Constant)	1.97	0.43	21.54				
Move 8: Termination							
Hard vs. Soft	0.26	0.47	0.30	.584	1.29	0.52	3.25
Pure vs. Applied	0.32	0.49	0.44	.507	1.38	0.53	3.57
(Constant)	1.43	0.37	15.30				

Move 7: $R^2 = .001$ (Cox & Snell); $R^2 = .002$ (Nagelkerke); Model χ^2 (2) = 0.131, $p = .936$.
Move 8: $R^2 = .006$ (Cox & Snell); $R^2 = .011$ (Nagelkerke); Model χ^2 (2) = 0.871, $p = .647$.

4. Discussion

4.1. Moves of 3MT

This study identified eight distinct moves in the 3MT presentations. Of these moves, six (**Orientation**, **Rationale**, **Purpose**, **Methods**, **Implication**, and **Termination)** were obligatory (i.e., present in 80% or more of the presentations), whereas two (**Framework** and **Results**) were optional. The obligatory moves can be attributed to the characteristics of academic speech and the communicative purposes of 3MT. First, the prevalence of the **Orientation** move seems to have stemmed from the crucial role that greeting and orienting the audience towards the content of a presentation can play in facilitating comprehension of a speech genre. This finding is consistent with those of Chang and Huang's (2015) study of TED talks and Rowley-Jolivet and Carter-Thomas's (2005) study of conference introductions. The latter study, in particular, found that Listener Orientation, a variation of the **Orientation** move in this study, was a "highly preferred" (p.58) strategy for conference presenters. The authors of the two studies also attributed the high frequencies of their Orientation moves to the influences of the speech mode. Second, the prevalence of **Termination** is also consistent with Chang and Huang's (2015) finding about the high incidence (91.8%) of an Acknowledgements/Gratitude move in TED talks. The use of **Termination** is obviously related to the exigencies of oral presentations: When facing a live audience, a presenter may feel obliged to express gratitude/appreciation to the audience for spending time listening as a way of ending the presentation and leaving a final good impression. Third, the high frequencies of the other four obligatory moves (i.e., **Rationale**, **Purpose**, **Methods**, and **Implication**) can be explained by the communicative purposes of 3MT, which requires presenters to help their audience understand, at the end of 3 min, "what you're doing and why you're doing it?" (Skrbis et al., 2010, p. 45). The **Purpose** and **Methods** moves can obviously address the "what" question, while the **Rationale** and **Implication** moves can answer the "why" question by articulating the motivation and significance of the presented research. Notably, the **Rationale** and **Implication** moves occurred markedly more frequently in the 3MT presentations than in other related genres such as thesis abstracts (Bunton, 1998), conference abstracts (Halleck & Connor, 2006; Payant & Hardy, 2016), and research article abstracts (Jiang & Hyland, 2017), indicating that 3MT presentations are more promotional than the other academic genres. This finding could be accounted for by the competitive nature of 3MT presentations.

The optionality of the **Framework** and **Results** moves can be ascribed to the unique characteristics of the 3MT genre and the on-going nature of the reported research. The low incidence of **Framework** is not surprising because 3MT is a speech genre targeted at a disciplinarily heterogeneous audience and, consequently, makes no assumption about a shared knowledge of a discipline's theoretical apparatus. Explaining a theoretical framework is not only costly given the 3-min time limit but also likely to involve the use of jargon against one of the judging criteria for 3MT presentations and pose a heavy cognitive

processing burden in real time on the part of audience. Thus, under the strict time constraint, describing a theoretical framework is not likely to be a priority for most presenters. Even in written academic genres such as thesis abstracts, which target a disciplinary audience and require much less processing efforts compared with spoken genres, such a move is also infrequently employed. Bunton (1998), for example, found that Position (equivalent to **Framework** in this study) appeared in only 3.6% of the texts in his corpus. Unlike the **Framework** move, the low frequency of the **Results** move was unexpected since one of the 3MT judging criteria requires a presentation to describe key results and outcomes clearly. In fact, only slightly more than half of the presenters (57%) chose to report their results. This is a surprizing finding but can be explained by the ongoing status of the research projects presented by most of the 3MT speakers. Rather than reporting results that were incomplete or unavailable, talking about the rationale or implications of the research was perhaps more realistic and preferable for these PhD students, as can be seen from the high occurrences of these two moves (91.55% and 86.62%). The low frequency and optional status of the **Results** move are in line with the findings of several previous studies (e.g., Halleck & Connor, 2006; Payant & Hardy, 2016; Rowley-Jolivet, 2002) on conference abstracts and presentations, which are also likely to be based on unfinished work.

4.2. Disciplinary generic variation

The statistical results reported earlier indicated that although the 3MT presentations from the four disciplines exhibited much more homogeneity than heterogeneity in their use of most moves, significant disciplinary differences were found in the deployment of three moves: **Framework**, **Methods** and **Results**. First, the hard-discipline presenters were less likely to deploy a **Framework** move in their presentations than their soft-discipline counterparts. This pattern is consistent with Bunton's (1998) finding that graduate students in soft disciplines were more likely to present their theoretical framework in their thesis abstracts than their hard-discipline counterparts. The pattern is also consistent with Holmes's (1997) suggestion that the lengthier background sections in social science research articles, as compared with those of natural science research articles, "might reflect the absence of an agreed theoretical framework" (p.328). These consistent cross-disciplinary differences indicate that presenting theoretical framework is more important in soft disciplines than in hard ones, regardless of the speech mode or genre in question. This disciplinary preference may be attributed to the epistemological orientation prevailing in soft disciplines. According to Maton's (2000, 2014) knowledge-knower framework, soft disciplines such as the humanities are characterized by hierarchical knower structures, where "knowledge-claims are predicated on attributes of knowers – who you are is more important than what you are discussing and how" (Hood, 2011, p. 108). In contrast, hard disciplines possess a horizontal knower structure, where the established "principles or procedures" (Maton, 2014, p. 92) of inquiry matter more than who the knower is. Researchers in soft disciplines often work in diverse, particularistic, unsettled fields that are open to interpretation and contestation. Consequently, knowledge claims in soft disciplines rely on the "unique insight of the knower" (Maton, 2000, p. 157) or a specialized language (i.e., a sound theoretical perspective) developed by respected knowers for legitimation. Such a specialized language legitimates knowledge claims and persuades by stressing the knower's individual authority and expertise (Cao & Hu, 2014). By contrast, knowledge claims in hard disciplines, where the knowers work "within a known framework of assumptions" (Becher & Trowler, 2001, p. 117), do not depend on stressing the unique qualities of the knowers but on following the established scientific principles and procedures. Consequently, there would be a less need for hard-discipline 3MT presenters to deploy the **Framework** move to accentuate epistemic conviction.

Second, the hard-discipline presenters were much more likely to employ the **Methods** move than the soft-discipline presenters. This markedly greater emphasis on describing and justifying methods in the hard-discipline presentations echoes the findings of previous research on written academic genres, such as Bunton (1998) and Hyland (2000) which found abstracts by writers in hard disciplines "tended to omit an Introduction in favour of a description of the Method" (p.70). This clear preference showed by both academic writers and 3MT presenters in hard disciplines for explaining and elaborating how the research in question was carried out can again be plausibly attributed to the knowledge-knower structures prevailing in the disciplines. Hard disciplines operate by a knowledge code, which means that knowledge legitimation in these disciplines depends crucially on following accepted procedures and instrumentation (Hu & Cao, 2015). Thus, for the hard-discipline 3MT presenters, to emphasize and elaborate on the adequacy of procedures and rigor of methodology would be epistemically persuasive. By contrast, the soft-discipline presenters worked in fields dominated by a knower code, whereby legitimation of knowledge claims is enhanced by displaying individual "aptitudes, attitudes and dispositions" (Maton, 2014, p. 92). Consequently, they were under much less pressure to describe and justify their methods than their hard-discipline counterparts.

Finally, the present study found that the pure-discipline presenters were significantly more likely to employ a **Results** move than their applied-discipline counterparts. This systemic variation is attributable to the underlying epistemological characteristics of pure and applied disciplines. Since pure sciences are mainly concerned with creating, explaining, and interpreting knowledge in contrast to applied disciplines' primary epistemological orientation toward knowledge application (Becher, 1989; Nesi & Gardner, 2006), the pure-discipline 3MT presenters would understandably be more motivated to report their results than their applied-discipline counterparts.

5. Conclusion

This study has identified six obligatory and two optional moves in 3MT presentations. The consistently high incidence of the obligatory moves across the sub-corpora can be attributed to the characteristics of 3MT as a speech genre, its overall

communicative purposes and its competitive nature, whereas the low frequencies of the optional moves can be explained by the exigencies of the genre and the unfinished status of the reported research. This study has also found systematic disciplinary variation in 3MT presentations that are largely consistent with the results of previous studies on written genres. Specifically, the hard-discipline presenters were much less likely to deploy a **Framework** move than the soft-discipline presenters. However, the former were much more likely to employ a **Methods** move than the latter. Furthermore, the pure-discipline presenters were more often observed to deploy a **Results** move than their applied-discipline counterparts. These patterns are explainable in terms of the dominant epistemological orientations and conventional knowledge-making practices in the respective disciplines.

The identified rhetorical moves and disciplinary generic variation of 3MT have not only addressed a gap in our knowledge of the academic speech genre but also have important implications for graduate students, 3MT workshop tutors, EAP instructors and other academics who are involved in teaching courses of general oral academic skills. The eight move types identified can serve as a viable pedagogical framework in a genre-based approach to 3MT, which is still absent from pre-competition workshops and relevant EAP classes. In light of scholarship on genre-based pedagogy (e.g., Cheng, 2015), one promising pedagogical strategy for prep workshops and relevant EAP classes is to use the identified moves as a "heuristic instructional framework" (Cheng, 2015, p. 134) so that students can be scaffolded to analyze genre exemplars, develop a rhetorical awareness of 3MT, and effectively master its rhetorical patterning. Furthermore, in view of the systematic disciplinary variation in the use of various moves, there is a need to adopt a more nuanced and contextualized approach to genre awareness and acquisition (Paltridge, 2013). Instruction on generic variation is likely to be more fruitful and effective if the functions of specific moves can be related to discipline-specific knowledge-making practices and epistemological orientations at work in a given discipline. In other words, instruction should be tailored to meet the specific rhetorical needs of students from different disciplinary backgrounds. With such genre-based instructional support, the quality of pre-competition instruction is likely to be enhanced, and so is the chance for participants to deliver competent and successful 3MT presentations.

Despite the aforementioned contributions of the present study, the findings and interpretations should be considered in view of its limitations. First, the identified move types have not been verified by disciplinary insiders or experts. Although it can be argued that expert opinion "is ultimately of no greater credibility than that about nomenclature" (Askehave & Swales, 2001, p. 198) and the 3MT genre is not a discipline-specific type of text, the involvement of disciplinary community insiders such as seasoned 3MT participants, judges and PhD supervisors in the collection, analysis and interpretation of the needed data could potentially add greater insight and validity to the identified moves. Second, the limited range of disciplines examined in this study might constrain the generalizability of the present findings, and further studies covering a wider spectrum of disciplines are needed. Third, linguistic features (e.g., promotional language, humor, and figures of speech) and paralinguistic performance-related aspects were not investigated in the present study. An examination of these features and aspects has the potential to develop a more comprehensive and nuanced understanding of the unique characteristics of this increasingly popular genre.

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