

THE CONTRIBUTION OF COMPLEXITY, ACCURACY AND FLUENCY TO LANGUAGE FOR SPECIFIC PURPOSES

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Abstract: *This paper will outline an instructional approach that proposes a Complexity, Accuracy, Fluency (CAF) paradigm as a means of providing learners with the CAF-based communication consciousness and CAF-oriented manipulative skills that are increasingly important in language use in Language for Specific Purposes. Given the complex combinations of communicative tasks, communicative formats and communicative circumstances that accompany the wide-ranging and various contexts of contemporary professional communication, communicative competence demands a combinative consciousness and informed application of Complexity, Accuracy and Fluency as a communication paradigm. Viewed as a combination of its three components, a CAF paradigm constitutes a fundamental 'information, language and communication' triad that can guide professional language use in any communicative circumstance. Viewed as a communicative skill set, the CAF triad implies the capability to adjust specific elements and aspects of information, language and communication as needed for a communicative task, whether in oral or print communication and regardless of task category. Adjusting complexity in this context refers to both content and language complexity. Adjusting accuracy refers to the conventions that dictate appropriate or acceptable language in a given context. Finally, adjusting fluency refers to a sense of communicative fluency, that which yields either smooth and persuasive language as in a native-speaker normative view or explicit and clearly explanatory language as necessary in some communicative encounters. The need to manipulate these three components depends on circumstance variables such as objective, available time, audience characteristics and the degree of detail desired. This paper will outline this combinative CAF notion as background to a materials development project being undertaken in a Japanese university, introducing the specifics of an Extended Reading Aloud format that involves learners in managing the content and language complexity, manipulating various language registers while focusing on accuracy, and proceduralizing communicative fluency in different communicative genres. While empirical testing of the interactions of Complexity, Accuracy and Fluency in a testing paradigm have yielded contentious and contradictory outcomes, the qualitative research findings presented in this paper contribute to an instructional application of CAF, a view that maximizes the potential of CAF in educational and communicative contexts. Although undertaken in a Japanese university English educational setting, the generalizations underlying the instructional materials are applicable to most ESL/EFL and LSP/ESP educational settings.*

Keywords: complexity, accuracy, fluency, communication, instruction, materials

1. Introduction

The linguistic aims within the broad scope of Language for Specific Purposes (LSP) are generally centered on the specifics of the language of the profession, primarily the specialized vocabulary and patterned phrases as dictated by the specific purposes inherent in the communication of that profession. Thus, in the past, LSP education has focused on semantic content together with the language patterns as used in such disciplinary-specific tasks. However, given the complex combinations of communicative circumstances, communicative tasks, and communicative formats that accompany the many and varied contexts of contemporary professional communication, particularly between cultures and increasingly across areas of speciality as undertaken by speakers from various language backgrounds as well as with non-specialists, there is need for another viewpoint, one that prioritizes a capability to communicate disciplinary content as a function of overall communicative competence. The reality of the various communicative needs that can emerge in professional language use between cultural, discourse and knowledge communities means that a combinative notion of Complexity, Accuracy, Fluency (CAF) can make a significant contribution to LSP in use and therefore constitutes an important element in LSP education. Introduction of a CAF paradigm as instructional content in an educational curriculum related to LSP will prepare learners to be flexible as they approach different rhetorical contexts, text formats and communication demands. CAF as a skill set implies the capability to adjust the three elements—complexity, accuracy and fluency—as needed for a communicative task, whether in oral or print communication, and regardless of the specific objectives and circumstances of the task, whether declarative, summary, or persuasive, and constrained by such factors as time (as in a speaking task) or space (as in written communication), or background knowledge on the part of participants. Ultimately, any instructional consideration of CAF in LSP implies an informed approach incorporated into materials development, herein through a project focusing on *Extended Reading Aloud* undertaken in a Japanese university setting.

2. Literature Review: LSP versus CAF

2.1 *Language in use and instructional approaches*

Although the context of Language for Specific Purposes (LSP) or English for Specific Purposes (ESP) implies that the focus should be, by definition, on language in a particular specialty, the contents herein focus rather on an instructional approach oriented toward language in use, one that provides understanding of CAF as a communicative paradigm and experience in adjusting CAF in actual communication, all with the aim of professional communication competence in the target language. The modern professional communication context implies communication both within a professional community itself, using specific terminology and phrasing, as well as with non-specialists, where a broader communicative competence is necessary. Gatehouse (2001) outlined these distinctions on the basis of an ability to use the jargon of the discipline, an ability to

operate organizationally within the discipline, and an ability to use the language informally when necessary. Doyle (2013) countered such separation by pointing out that all language use can be considered LSP in one sense or another, either narrowly, as in language use for specific disciplines, professions or communicative work situations, or more broadly, as in cases where language is used informally, a specific cultural, ethnographic, pragmatic, and socio-dialectal use of language. In either conceptualization, it is clear that LSP instruction must broaden its scope and address communicative competence.

In terms of an appropriate and effective LSP/ESP instructional approach, one aspect often overlooked is the reality of the needs of the message recipient. Indeed, Strevens (1988) and Dudley-Evans and St. John (1998) outlined the characteristics of ESP in its focus on the language of a speciality, the discipline it serves, and, with specific reference to instruction, its use toward meeting the needs of the specialist as language learner and user. Lacking in such a 'language and learner-centered' approach is recognition that communicative use of language implies effective communication with a target audience as an endpoint, often across a range of communicative formats. It is in this aspect that our instruction is less about ensuring that our students can master the fundamentals of some profession-specific code of communication than ensuring that they master an understanding of overall effective communication skills and have practice in using these skills such that their communication is effective. As Pace (2011) thus asserts, teaching a foreign language for specific purposes must reflect a use-based instructional approach. In terms of materials development, Bowles (2012) reminds us that a key challenge to the pedagogy and praxis of LSP lies in the reality that LSP practitioners must resolve issues of transitioning LSP-related analytical insights into instructable materials for the widest potential community of learners such that they can realize the widest range of successful communication. The objective of this research is to organize and test an approach that will prepare learners to adjust the CAF of their language to meet varying objectives and circumstances within a professional context.

2.2 CAF as an information and communication management system

Most research applications of Complexity, Accuracy and Fluency have been directed toward second language acquisition or performance testing (*cf.* Special Issue: Complexity, Accuracy and Fluency (CAF) in Second Language Acquisition Research, *Applied Linguistics* 30(4), 2009 or Housen, Kuiken & Vedder, 2012), where the three components are considered either separately, as competing factors that compromise performance (Limited Capacity Model: Skehan, 2001; Skehan & Foster, 1999), or in combination, as cognitively integrated factors (Cognition Hypothesis: Robinson, 2001). While much of this acquisition/performance testing-oriented research has been organized with a focus on task characteristics and measurement criteria, more recent research has considered CAF in terms of longitudinal development (Vercellotti, 2015) or premised CAF as within a dynamic systems theory framework (Larson-Freeman, 2012; Yang & Sun, 2015). However, when viewed specifically both in combination (as opposed to separately) and as an instructional paradigm (as opposed to in performance testing), Complexity, Accuracy, and Fluency (CAF) constitutes a

fundamental information, language and communication triad that can be taught, and thus learned, so as to guide language use in any communicative circumstance. These three qualities of language in use—informational content, syntactic structure, and communicative action—demand varying degrees of management and manipulation in actual language performance and interaction, and all three draw on the preparation—topical, linguistic, and communicative—and the capacity—linguistic, but also pragmatically communicative—of the speaker.

Fundamentally, complexity refers to the formal or semantic-functional properties of the language elements, but when considered in terms of language use in disciplinary-specific purposes, complexity also includes propositional complexity, as outlined by Bulte & Housen (2012), which identifies implications about the complexity of content as managed by the speaker. Accuracy refers to correctness, in its clearest sense, the extent to which a performance deviates from a prescriptive norm (Pallotti, 2009). However, problematic in terms of accuracy are considerations related to determination of what constitutes an ‘error,’ most notably in the communicative impacts of local errors versus global errors, as well as varying expectations and assessments of comprehensibility, appropriateness and acceptability (Housen, Kuiken & Vedder, 2012). Finally, fluency is most often viewed in terms of global language proficiency, usually measured against the standard of a native speaker and assessed in terms of speed fluency, breakdown fluency, and repair fluency (Skehan, 2009). However, here as well, conceptual expansion must be considered with regard both to use norms in various socio-cultural discourse communities on the one hand and the reality that ‘communicative fluency’ may in fact, counter usual considerations of fluency as proficiency, as ‘communicative fluency’ may imply slower and more enunciated speaking with repetition and rephrasing to ensure clarity of the utterance by the speaker and comprehension by the listener.

Given the interaction of the triadic components of CAF in terms of realizing effective communication, the instructional approach to be described herein views CAF as an information and communication management system. As such, complexity reflects manipulation of content complexity and management of the accordant language complexity, accuracy is a reflection of general language ability and the capability to adjust highly specific and professional language to situational demands regarding comprehensibility and acceptability on the part of the communication recipient, and fluency reflects adjustment of communication behaviour in response to situational factors such as time constraints, specific objectives, and participant characteristics. As a simple example of the reality and extent of information management and message manipulation in communication, one can imagine scenarios such as discussion of highly technical content (nuclear power) either among knowledgeable and like-minded experts or with relatively uninformed antagonists. These differing contexts would require either a high level of content complexity or, conversely, low level of content complexity, with the level of linguistic complexity dependent on this content level, and with either a high level of objective fluency (i.e. speed, breakdown and repair fluency but a low level of communicative fluency among the experts) versus a high level of communicative fluency (emphasizing clarity but with lower levels of objective fluency for the uninformed). Likewise, the same combination of factors can be identified for simple

conversational content (weekend plans), depending on the level of content complexity (background factors and specificity, for example) and group communicative norms and situational expectations (simply reporting on plans versus attempting to persuade a friend to accompany you).

3. The instructional approach: *Extended Reading Aloud*

The basis of the instructional approach for the research reported on herein is '*Extended Reading Aloud*,' the use of repeated vocalized readings accompanying traditional vocabulary and grammar study as input, which is followed by activation of this content and language input as output, but adjusted for various objectives and under various situational constraints. The positive effects of reading aloud have been shown (Stroh, 2012; Yokouchi, 2015), with task repetition, constituting the 'extended' component of *Extended Reading Aloud*, yielding task proceduralization (de Jong & Perfetti, 2011; Date, 2015). The 'content' of the instructional materials includes six personal/individual themes and six academic/professional themes. These themes are presented as input through two successive 'Extended (Repeated) Read Aloud' tasks that are organized as either 'presentation' genres (academic presentations, interview formats, symposium formats, etc.) or 'conversation' genres of a varying number of participants and with varying aspects of agreement versus disagreement and summarization, description, persuasion and opinion. This is the combinative aspect of CAF through *Extended Reading Aloud*. The topic indicates content, with content and language complexity a function of the objective in either a presentation genre or a conversation genre. Focused study addresses vocabulary acquisition, solidification and expansion together with syntactic accuracy. Repetitive reading aloud implies performance proceduralization, providing for fluency in a particular genre. Undertaking the same content in different communicative genres calls for adjustments in the complexity of content and subsequently the language used, as the 'language' of, for example, a presentation genre versus a conversation genre varies significantly despite the similarity of the content.

As an example of the variation between genres in the readings, consider the following two passages about 'responsibility for protection of the environment,' noticing the variations in form that are possible and the reductions between the 'original official' form and the 'student retelling' (Rausch, 2015):

Passage 1

Local Resident Representative: Protection of the environment is ultimately the responsibility of ordinary individuals acting as responsible citizens and consumers. But we also have to understand that protecting the environment is more than just reducing energy and material consumption. More important is recognition that we have to force government and business to fulfill their roles and do their parts as well. Government is supposed to make laws that protect the environment for the good of all citizens, but we have seen that government doesn't always respond to citizen demands. And although one would think that

protecting the environment would be 'good business,' the truth is that we cannot trust the private sector to do what is right in terms of environmental protection – businesses prioritize profits. We must force business to do what is right for the environment through consumer pressure. In the end, it is only through clear citizen demands to government and consumer action toward business that the environment will be protected. (160 words)

Passage 2

Student reporting on what the Local Resident Representative said: *The Local Resident Representative said that citizens are responsible for protecting the environment, and that we do this through forcing government and the private sector to take proper action to do so. Laws are necessary, so we have to ensure that the government makes those laws, and businesses cannot be trusted in this regard. Ultimately, we have to demand that government fulfills its role, and, through our consumer power, force businesses to protect the environment along with making profits.* (79 words)

Together with traditional language learning activities that focus on intensive language study for sake of accuracy, this constitutes the 'input' stage of the instructional process, but with the *Extended Reading Aloud* repetition as a fundamental aspect of this input. The 'output' stage, with a focus on realistic language production, involves having learners activate the 'input' through language production with various objectives and under various conditions. The objectives might include 'reporting-summarizing,' 'reaching agreement-expressing disagreement,' 'explanation of details-justification of action,' or simply reporting on one's own ideas, each with differing format, time, target listener, and other situational variables. In this manner, the learner is forced to adjust complexity (content, but also linguistic), ensure accuracy (to the degree possible depending on learner level), and approach fluency (whether objective or communicative).

4. Research findings

As the objective of the present research is less to clarify the interactions between the three CAF components in a performance testing paradigm than to develop a curriculum and instructional materials that will provide for consciousness of CAF and skills in manipulating CAF under various task conditions, the qualitative assessments herein differ from the quantitative parameters used in most research approaches, which have largely yielded contested and competing claims (Housen, Kuiken & Vedder, 2012; Tonkyn, 2012). As such, student task responses, taken both in spoken form and in written form (with time constraints used as fluency impact factors), were assessed both with general measures of complexity, accuracy and fluency and with assessments of competence. For assessment of complexity, along with overall length and linguistic complexity assessment, the primary measure is the degree to which the student-produced content matches or

extends the original content of the textbook in terms of both content and language (propositional complexity and linguistic complexity). Regarding accuracy, assessment considers both deviations from the textbook language, as well as errors: local-insignificant (grammatical: no impact), local-significant (grammatical: some impact on meaning or comprehension), global-insignificant (impact on overall meaning: not significant) or global-significant (impact on overall meaning: compromises overall meaning). As for fluency, a variety of measures are used, including completion and completeness within the time constraint, use of discourse features introduced in the textbook, and subjective 'quality' assessments by classmates (Rausch, 2014). A final assessment point is self-assessment and protocol statements by the 'speaker,' where Likert-based responses regarding satisfaction and self-assessment of the complexity, accuracy and fluency along with recall about the factors influencing the language production are considered against these external assessments. While questions regarding the reliability and interpretability of self-assessment remain (Saito, n.d.), learners have been found to be generally correct in their self-perception of their language performance (Bei, 2012). Taken together, this overall assessment approach captures CAF consciousness, CAF manipulation capability and CAF communicative quality on the basis of the instructional approach.

Based on tasks that require students to 'make a presentation (written form) on a textbook topic,' previous findings relevant to the present research revealed three CAF 'performance' groups, described in the first two groups by their focus on 'language complexity,' in which learners used language for content as presented in the text, and 'content complexity,' reflecting the generation and inclusion of original content in learner produced language (Rausch, 2014). Protocol responses by the former group (language complexity) revealed this focus on 'language complexity,' as students sought to mirror the content and language of the text, a consciousness of producing a highly accurate performance within the time constraint. Indications by the latter group (content complexity) revealed attempts to expand on the textbook content by complementing it with additional content. Hence, the focus in the first group was the input content and language presented accurately, whereas the focus in the second group was additional content equating added complexity undertaken with less regard to compromises in language accuracy, with both groups deemed fluent in terms of effectively completing the task under the situational constraints. The third group was a limited performance group, both in terms of complexity, whether content or language and textbook based or original, and fluency; this third group clearly needed more time to complete the communicative task, with some question as to the quality of the performance that could be attained even with more time allowed.

Similarly, in the present research, language complexity versus content complexity reflected either an adherence to content (and language) as presented in the textbook versus attempts to incorporate additional content (and language) added to the text content, but again within the fluency considerations of the task measured as a function of time constraints (i.e. completing a task competently within a set amount of time). The primary research methodology in the present research consisted of an instructor evaluation of student 'content performances' over several 'from-memory content presentation' tasks together with student self-

assessments of their own 'task competence.' On the basis of assignment to higher level or lower level classes based on university entrance exam scores, students were categorized as high expectation (N=31) or low expectation (N=35). The research consisted of three fairly similar timed tasks, one of 12 minutes, one of eight minutes and one of five minutes, in which students were instructed to report on a theme that had been studied in the *'Extended Reading Aloud'* textbook. For the high expectation group in the 12-minute task, instructor evaluation of content found that, similar to the previous research findings, approximately 35% of students responded with 'high textbook content and high language accuracy.' Slightly more (40%) responded to the task with 'high original content and moderate language accuracy'. Finally, 25% yielded a poor performance, characterized by completion of the task, but with poor content (reflecting neither text content nor original content) and poor overall language accuracy. While problematic CAF factors influencing task competence were reported to be minimal for the 'high textbook content and high language accuracy' group, lack of content knowledge, rather than lack of language capability, was reported as problematic by the 'high original content and moderate language accuracy' group, with lack of time the problematic factor for the low performance group. Differing from this three-group characterization for the 12-minute task, responses to the five-minute task revealed a more basic division, revealing a high textbook content complexity and high language accuracy group (60%) versus a low content complexity and low accuracy group (40%), meaning that, while limited time is a detrimental factor for most, more pointedly, those that mirrored a complex text can manage under time constraints on the one hand, but those prioritizing additional content gave up and opted for the text as guide as well on the other.

Turning to the student self-assessment measure, for the high expectation group, based on a five-point Likert scale self assessment, 26 out of 31 students assessed their overall task competence as low (self-assessed as 3, 2, 1), countered by just 5 out of 31 who viewed their overall performance as competent (self-assessed as 4, 5). However, when assessing aspects of competence in specific terms of complexity, accuracy or fluency, ten of these 26 self-assessed 'low competence' students saw their complexity competence as high and ten saw their fluency competence as high, with overlap in approximately half of these high competence responses (with the remaining ten not rating themselves high on any CAF component). On the other hand, for the low expectation group, 18 out of 32 students assessed themselves as low in overall competence against 14 who viewed their performance as high (three non responses). The results regarding specific components of complexity, accuracy and fluency for the low expectation group were, however, more mixed, with a random six students citing high competence for complexity and accuracy and eight for fluency; the remainder did not indicate any high CAF component.

This stage of the research indicates that, with manageable time circumstances, one-third of learners will respond to a task based primarily on the content they have studied, managing complexity, accuracy and fluency on this basis and completing the task adequately. An additional one-third will seek to expand on the content complexity, risking the language quality of the original content due to limitations in accuracy but being able to work within the fluency constraint (i.e. complete the

task) in order to add their views or additional information relevant to the task theme. Finally, one-third of the learners could complete the task minimally, but with questionable content complexity and language accuracy (limited or incomplete content and significant local and global errors). However, under more constrained communication conditions (limited time), attempts to include original content are largely abandoned, as that otherwise could be opted for more manageable content and language, with some unable to adapt to the time constraints. Furthermore, learners tended to view their overall performances somewhat negatively (although this might be a Japanese trait), even as they were able to separate out assessments of specific CAF elements within this overall assessment, as indicated by the positive competence self-assessments to complexity and fluency. This should be indicative of consciousness of the separate elements of CAF, awareness of the differing nature of the elements, and potential for more specific instruction toward greater manipulation of the CAF elements on the part of learners.

5. Conclusion

This paper outlined the basis for an instructional approach to Language for Specific Purposes (LSP) prioritizing introduction and manipulation of Complexity, Accuracy, Fluency (CAF) as a means of providing learners with the wide-ranging communication skills useful in LSP. Given the complex combinations of communicative circumstances, tasks, and formats that accompany various contexts of professional communication, communicative competence in LSP demands an extensive and combinative notion of CAF. An understanding of CAF and experience manipulating the components of CAF implies the capability to adjust the three elements as needed for a communicative task across task genres and situational constraints. In the present research, communicative intentions and CAF skills resulted in performances that either sought content complexity through reliance on a fixed text or expansion of content complexity by virtue of inclusion of additional information, with each being realized within fluency constraints but with lower language accuracy in the latter. As the research findings indicate, under a CAF paradigm, some students made a conscious decision to focus on the text content and language so as to be accurate and fluent, whereas other students accepted concessions to lower accuracy in the form of local errors in order to expand the content complexity while keeping to specific fluency constraints. The fact that students reported varying competencies regarding complexity competence and fluency competence within a low overall performance competency assessment indicates that they are aware of the three separate elements of a CAF paradigm.

While the trajectory of language learning tends to progress from simpler vocabulary and forms to more complex, particularly when transitioning from general language learning to LSP/ESP, it is important to keep in mind, and to ensure that LSP/ESP learners have in mind, the fact that under different communicative circumstances, adjustments in complexity of both content and language are necessary. In the present research, learners seemed to be aware that they could control the Complexity, Accuracy and Fluency components of communication, even within a performance judged to be of low overall quality. Yet attempts to manipulate those components proved more elusive, as learners seemed to abandon attempts

at simplifying original content under stricter time constraints, instead opting for reliance on learned input in prescribed language. The instructional materials introduced used an *Extended Reading Aloud* approach based on different genre treatments of similar content as a means for learners to 'experience' changes in CAF, with an 'output' component undertaken under diverse situational variables (differing time constraints) that provided them the opportunity to practice control and manipulation of CAF in their own language production. The results of the qualitative research oriented toward better instruction indicate the potential to develop consciousness of the specific CAF elements and awareness of their own strengths and weaknesses in manipulating those elements. This indicates the potential for more informed and focused instruction and practice on using Complexity, Accuracy and Fluency as a means of improving communicative performance under diverse communicative circumstances. While undertaken in a Japanese university setting with undergraduate students, the approaches presented logically extend to most LSP/ESP educational settings.

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