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A comparison of data commentary in chemical engineering research papers and master theses – exploring the intersemiosis of written and visual material for applied purposes.

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## **A comparison of data commentary in chemical engineering research papers and master theses – exploring the intersemiosis of written and visual material for applied purposes.**

In the field of English for Specific Purposes, data commentary, the written comment on visual material has been recognized as a particularly complex area that presents problems even for fairly advanced university students (Blåsjö 2011; Wharton 2012). Yet, few studies focus on it. In approaching data commentary from a pedagogical perspective, two problems emerge 1) practices tend to vary depending on disciplinary field and on the type of visual presented (Stoller and Robinsson, 2013), and 2) teachers in the various science fields find it challenging to teach data commentary, possibly because they are too entrenched in disciplinary practices (Blåsjö, 2011). To uncover areas of particular difficulty for ESP students, there is thus a need for investigation of disciplinary variance of how the written and visual modes are integrated in disciplinary texts as well as of studies comparing expert and student writing (Gilquin et al, 2007).

In a first step towards addressing these needs, this study investigates differences in data commentaries in master theses written by Swedish advanced learners of English and published research articles written by native and non-native disciplinary experts. All data commentaries are extracted from the result and/or result & discussion section of papers from chemical engineering and compose a small discipline-specific *learner* (master theses) and *expert* (published research articles) corpus, where the definition of learner is motivated by a distinction between *apprentice* and *expert* writers. The data commentaries are annotated for rhetorical moves (Swales, 1990) according to the Biber-Connor-Upton approach (Biber et al., 2007) and by means of the UAM corpus tool, developed by Michael O'Donnell.

Preliminary results indicate that expert and novice writers differ in their choices both at the level of discourse, in terms of selection of rhetorical moves, and at the level of lexicogrammar, in terms of the phraseology associated with specific moves. An intriguing finding concerns differences in the lexicogrammatical realization of the rhetorical move addressing the most important result, or trend, displayed in a visual. Expert writers in chemical engineering commonly use a lexical nominalization for this move, whereas students overwhelmingly rely on *that*-clauses. I argue that the experts' use of lexical nominalization is similar to the well-known rhetorical function of lexical nominalization to condense Given information (Halliday and Martin, 1993) in science discourse, but here the Given information is first presented in a visual. This finding is of importance for ESP courses addressing the intersemiosis (O'Halloran, 2005) of visual and written material in the multi-modal presentation of results in chemical engineering, and is an interesting topic for further studies of data commentary and multimodality across disciplines.

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