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## Preface

### Cumulative knowledge-building in secondary schooling: Guest editors' preface

This Special Issue of *Linguistics and Education* explores cumulative knowledge-building in secondary schooling. It arises from a major research project into 'Disciplinary, Knowledge and Schooling', funded by the Australian Research Council (Grant Number DP0988123), that has brought together scholars from systemic functional linguistics, the sociology of education, and ethnomethodology. In the first paper of this issue, 'Knowledge and school talk', Peter Freebody introduces this project with a call to arms. He highlights the relatively undertheorized nature of our understanding of how classroom talk mediates written forms of educational knowledge, and argues that far more attention needs to be paid to literacy if we are to understand school work. In doing so, he introduces many of the key issues that motivated the genesis of this interdisciplinary research endeavour. The project itself involved extensive textual analysis of curriculum materials, teaching texts, 100 hours of video-recorded classroom interaction, and a pedagogic intervention involving teacher training and support. This research is not only shedding light on how knowledge-building is enabled and constrained within classrooms discourse but also, and just as significantly, directly leading to theoretical developments in both systemic functional linguistics and the tradition of code sociology inspired by Basil Bernstein. As we explicate below, each of the papers in this issue begin from and clearly relate their ideas to the question of cumulative knowledge-building; here we briefly contextualize these theoretical developments.

There has been a long and fruitful history of exchanges between systemic functional linguistics (SFL) and code theory, beginning in the 1960s with conversations among Basil Bernstein, Michael Halliday and Ruqaiya Hasan. Space precludes discussing this rich history in any detail, but several general features of these relations are worth briefly highlighting here. First, dialogue between the two approaches has embraced a widening range of preoccupations over time. Analysing the dialogue, Martin (2011) offers a heuristic schema charting a series of principal phases, where each phase highlights new points of contact for discussion in addition to the ongoing conversations of existing phases. Table 1 adapts this schema to highlight four such phases of dialogue and the key concepts each phase has brought into the conversation.

As Table 1 suggests, dialogue between SFL and code theory has concerned an evolving series of issues, as the frameworks have themselves evolved. New ideas developed within each approach have added to and at times re-enlivened these relations, adding new avenues for mutual influence and shedding fresh light on existing ideas. For example, the first three phases involved key ideas from the development of code theory by Bernstein, principally his conceptualizations of: actors' socialized dispositions in terms of 'coding orientation' (1971); the construction of 'pedagogic discourse' (1975, 1990); and intellectual fields of knowledge production as different forms of 'knowledge structure' (2000). The second and suggestive framework Bernstein bequeathed has continued to develop in the form of Legitimation Code Theory (LCT). This framework works within the problematic and approach established by Bernstein to extend, integrate and subsume concepts from code theory (Maton, 2013). In doing so, LCT has re-worked existing ideas from across this history and, as the table intimates, re-ignited dialogue with multiple areas of SFL, including field (Martin, 2007; Martin, Maton, & Matruggio, 2010) and identity (Martin, 2012). Dialogue between the two approaches is thus reaching across manifold issues, both substantive and theoretical. The project discussed in this Special Issue forms part of this dialogue by bringing together LCT with SFL.

**Table 1**

Key foci of dialogue between code theory and systemic functional linguistics.

Period began	Code theory	Systemic functional linguistics
1960s	coding orientation	semantic variation
1980s	pedagogic discourse	genre-based literacy
1990s	knowledge structure	field
2000s	LCT: Specialization and Semantics	individuation/affiliation, field, mode, appraisal, grammatical metaphor, and many others

Secondly, as with any sustained inter-disciplinary dialogue, intensity of relations and directions of influence have both ebbed and flowed. As papers in this Special Issue demonstrate, the latest phase comprises not only dialogue and mutual inspiration but also intense and close collaboration in the analysis of shared data. Discussions concerning relations between theories and the possibility and gains of inter-disciplinarity are frequently conducted at distance and in the abstract. All too often such comparisons reduce one approach to another or announce the incompatibility of different frameworks. In contrast, papers here concretely demonstrate the value of close inter-disciplinary collaboration through the explanatory power this offers in engaging with a shared substantive problem, namely cumulative knowledge-building in secondary schooling. They show how different approaches can shed not only complementary but also mutually informing light on an issue. Many of the key ideas elaborated for the first time in these papers – including ‘semantic waves’, ‘power words’, ‘power grammar’, ‘power composition’, ‘temporal shifting’, among others – were developed during the course of this project, from encounters not only between each existing framework and the data but also with each other’s analyses.

Most of these new concepts are introduced in the papers by Maton and by Martin. In ‘Making semantic waves’, Maton introduces key theoretical ideas from LCT that underpinned the project, both as research study and as pedagogic intervention. Maton begins from the problem for understanding knowledge-building of ‘knowledge-blindness’ in educational research: an inability to see knowledge itself as an object of study. He introduces relatively new sociological concepts from LCT – ‘semantic gravity’ and ‘semantic density’ – that systematically conceptualize one set of organizing principles underlying knowledge practices. Using these concepts to analyze passages of classroom practice from secondary school lessons in Biology and History, Maton suggests that ‘semantic waves’, where knowledge is transformed between relatively decontextualized, condensed meanings and context-dependent, simplified meanings, offer a means of enabling cumulative classroom practice. How these concepts are being widely used to explore organizing principles of diverse practices in education and beyond is discussed, revealing the widespread, complex and suggestive nature of ‘semantic waves’ and their implications for cumulative knowledge-building.

In ‘Knowledge as meaning’ Martin takes as point of departure the SFL register variable field, and explores its application to the discourse of Biology and History in secondary school classrooms. In particular he considers the ways in which uncommon sense knowledge is organized in these subject specific discourses, and its critical relation to the high stakes reading and writing expected from students. Uncommon sense is explored in terms of specialized composition and classification relations among technical entities, and their participation in processes unfolding through implication sequences. Martin suggests that the organization of knowledge in classroom interaction and reading and writing tasks can be made more accessible to teachers through the practical concepts of ‘power words’, ‘power grammar’ and ‘power composition’.

Together these papers suggest that cumulative knowledge-building is enabled by making ‘semantic waves’ in knowledge and involve the mastery of a ‘power trio’ of linguistic resources. The following two papers build on these concepts and thereby highlight a further characteristic of current relations between SFL and LCT, namely that direct collaboration in empirical research is not only leading to the generation of new ideas but also the emergence of a new generation of scholars who are more bilingual – they are increasingly fluent in *both* SFL and LCT. This issue includes papers first-authored by two educational linguists, Erika Matruglio and Lucy Macnaught that bring together ideas from both approaches. In ‘Time travel’, [Matruglio, Maton, & Martin \(2013\)](#) further explore cumulative knowledge-building in History teaching to highlight a key feature concerning the manipulation of time. Specifically, they reveal how making semantic waves in History teaching involves ‘temporal shifting’ and examine the linguistic resources this involves. In ‘Jointly constructing semantic waves’, [Macnaught, Maton, Martin, & Matruglio \(2013\)](#) discuss the pedagogic intervention stage of the project, exploring the implication of LCT’s ‘semantic waves’ and SFL’s ‘power trio’ for teacher training. Specifically, they focus on the experience of a Year 11 Biology teacher’s experience of new metalanguage and explicit pedagogy, in teacher training, and first attempts at classroom Joint Construction, a form of collaborative text creation.

In the final paper of this Special Issue, Peter Freebody looks closely at the nature of the interaction between teachers and students, from an ethnomethodological perspective – representative of this major strand of classroom discourse research (complemented elsewhere, from an SFL perspective, by work inspired by [Sinclair & Coulthard, 1975](#); e.g. [Christie, 2002](#); [Dreyfus & Martin, in press](#)). He focuses on the details of the speech exchange systems in classrooms, highlighting the fine coordination of interaction that classrooms display. Freebody also focuses on the procedural definitions of the connection between literacy and knowledge that serve the purposes of initiating and maintaining lessons, compared to definitions that are operable in the production and assessment of students’ learning through their written assignments. He suggests that constructs such as ‘knowledge’ are occasioned, purpose built-through on site through conventionalized systems of exchange that, reflexively, function to bring off the events that constitute the workings of such sites. The challenge for students in many classrooms, he argues, is to provide the ‘missing what’ that connects the daily heavy duties of classroom talk, which determines their success as classroom participants, to the occasional high-stakes writing performances that will come to characterize their success as learners. It is this ‘missing what’ that the preceding papers and concepts of ‘semantic waves’ and ‘power trio’ of linguistic resources also aim to help explore. In doing so, this research not only focuses on cumulative knowledge-building but also is helping to itself build knowledge about education.

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