Systemic functional linguistics and code theory

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Introduction

No theory is an island. In the case of systemic functional linguistics (SFL), its most long-standing and intense relationship has been with code theory, a sociological framework originated by Basil Bernstein that has recently been developed into Legitimation Code Theory (LCT) (Maton 2014b). From their beginnings, scholars developing these approaches have engaged in exchanges over a wide range of issues, sparking advances in both frameworks, posing questions to each other and providing fresh insights on persistent concerns. Indeed, in recent years, this dialogue has intensified as SFL and LCT have become increasingly used together in joint analyses of shared data (Martin and Maton 2013; Vidal Lizama 2014; Hood 2016). These genuinely interdisciplinary projects are leading to a growing number of fundamental innovations in both approaches and the emergence of a generation of scholars who are theoretically 'bilingual'. With such intertwined biographies, then, to understand SFL, one must understand its exchanges with code theory.

This chapter explores relations between the two theories, the forms that these exchanges have taken and how they have shaped each other. We consider the past, present and possible future natures of this dialogue. First, we trace the evolving history of exchanges, outline the advances that they encouraged and highlight the foundations each phase laid for future exchanges. Second, we explore current close collaborations between SFL and LCT in which research is productively utilising both approaches in interdisciplinary analyses of shared data. Finally, we consider possible paths for future collaboration, and offer insights into why SFL and code theory are working so effectively together across an ever-widening range of issues, topics and contexts.

A history of dialogue

Exchanges between SFL and code theory can be traced back to the 1960s. During the course of this history, the relationship has evolved as the focus of substantive studies changed and each theory developed. The direction and intensity of influences between the theories have

also ebbed and flowed, waxed and waned. Extending Martin (2011), we will highlight five principal phases of exchange that differ in content and form, and thereby serve to illustrate this rich and variegated history. Table 38.1 summarises when these five phases of exchange began and the key concepts at stake in each. Of course, such divisions in a continuously unfolding history are intended to be heuristic, rather than definitive. Identifying distinct 'phases' in an ongoing dialogue between theories that are themselves developing at the same time is not straightforward. Phases overlap one another as conversations continue. Each phase evolves, such that further divisions could be added. What we describe as 'phase I', for example, comprises at least two periods of intense activity between which there was considerable conceptual development ('semantic variation' was coined only in the 1980s). However, our aim is not to make a map as big as the country, but rather to briefly illustrate more than fifty years of dialogue between two complex approaches in a short chapter. Thus, in addition to stating the obvious points that our account is necessarily partial and focused more on how exchanges with code theory have shaped SFL than vice versa, three key attributes are worth briefly highlighting.

1   The progression summarised in Table 38.1 is sedimental: later phases add to, rather than replace, existing phases.
2   The concepts listed are not the only theoretical ideas enacted during these exchanges, but those that we consider most at risk of change in each phase as interdisciplinary dialogue helped to shape each theory's development.
3   This is not a summary of the intellectual history of each theory. Often, concepts central to a phase of dialogue were created separately, earlier and for different purposes. The SFL variable of field, for example, was initially developed in the 1960s (see Bartlett and Bowcher, both this volume) and became a focus of research in educational linguistics during the 1980s (Rose and Martin 2012), but assumed centrality in exchanges with code theory, as a key concept at risk, only during the 2000s (Table 38.1).

Caveats stated, we shall now focus on phases I–III, which established foundations for the current and ongoing intensive collaborations between the two approaches.

Table 38.1 Summary of principal phases of exchange between code theory and SFL

Phase	Period began	CONCEPTS CENTRAL TO PHASE OF EXCHANGE FROM:	
		Code theory	*Systemic functional linguistics*
I	1960s, 1980s–	coding orientation	linguistic variation, semantic variation
II	1990s–	pedagogic discourse	genre-based literacy
III	Early 2000s–	knowledge structure	field
IV	Mid-2000s–	LCT: Specialisation dimension (specialisation codes, knowledge–knower structures, insights, gazes, etc.)	individuation/affiliation, field, appraisal, etc.
V	2010s–	LCT: Semantics dimension (semantic gravity, semantic density, semantic profiling, etc.), constellations and cosmologies	mode, field, appraisal, grammatical metaphor, technicality, individuation/affiliation, literacy, iconography, etc.

Phase I: exploring variation

A first phase of dialogue had begun in earnest by the 1960s, inspired by discussions among Basil Bernstein, Michael Halliday and Ruqaiya Hasan. This phase centred, on the one hand, on Bernstein's (1971) notion of *coding orientation*, which conceptualised the ways in which actors' dispositions are shaped by their social backgrounds and, on the other hand, what later came to be known as 'semantic variation' – that is, the social distribution of these orientations to meaning (Hasan 2009). This phase was characterised by mutual influence on ways of thinking. For example, Bernstein (1995: 398) later stated that, thanks to discussions with Halliday and Hasan, 'it became possible for me to think about linguistics in sociological terms and sociology in linguistic terms', and that, despite shifting his focus from linguistic to educational practices, SFL 'continued to provide a creative dialogue and tension'.

The phase also involved more directly conceptual relations. In particular, SFL provided a means of grounding Bernstein's early sociolinguistic framework. From the outset, Bernstein had attempted to specify the variation of actors' dispositions linguistically. In 1959, for example, he distinguished 'public language' from 'formal language' through their relative complexity of syntax and frequency of conjunctions, adverbs and adjectives (Bernstein 1971: 31). Such linguistic features were initially characterised in formal and traditional terms, with minimal reference to meaning. However, by the end of the 1960s, Bernstein and his colleagues at the Sociological Research Unit (SRU) in the Institute of Education were engaging with Halliday's meaning-based grammar (Bateman, this volume), developed nearby at University College London. Using these tools, SRU researchers were able to make generalisations across quantitative data. This is illustrated by studies collected in the second volume of *Class, Codes and Control* (Bernstein 1973). For example, Hawkins (1973) focused on the use of reference within the nominal group by 5-year-old children of different social classes. The study utilised Halliday's newly developed (although not yet published) grammar of the *nominal group*, in conjunction with Hasan's distinction between *anaphoric* (looking back), *cataphoric* (looking forward) and *exophoric* (looking out to the situation) reference (Halliday and Hasan 1976). A large set of language data was systematically coded, finding statistically significant differences in language use between working-class and middle-class children. In effect, Hawkins used SFL as a means of translating between code theory and empirical data.

However, SFL did not yet possess sufficient resources for probing the social system to the extent required by code theory. Halliday (1995: 135) later suggested that, at this stage of development, the framework was unable to address the subtle features of grammar critical to the nuanced distinctions needed for sociological concerns with the social distribution of coding orientations. Thus, although already elaborate in comparison with other theories of language, SFL required further development before it could respond to questions posed by code theory. Over the coming decades, SFL would steadily develop its resources in ways that reanimated this exchange.

The SRU, which had brought linguists and sociologists together into close collaboration, was closed by Bernstein during the early 1970s. Nonetheless, Ruqaiya Hasan, who relocated to Sydney in 1976, maintained this focus on semantic variation within a major study of mother–child interactions. Semantic networks were developed that built upon those developed at the SRU (Turner 1973), to be generalisable across language contexts (Hasan 2009). These networks drew upon the rich functional grammar that had been developed by Halliday (Halliday and Matthiessen 2014), allowing Hasan to elaborate the semantic description in ways sufficiently sensitive to explore relations between coding

orientation, social class and gender in discourse involving mothers and young children. Using these tools, Hasan (2009) found significant differences between the meanings made by mothers depending on whether the main breadwinner of the household occupied a profession of higher or lower autonomy. Hasan's corpus comprised naturally occurring data rather than responses to interview questions or language-eliciting tasks, as had characterised SRU studies (Bernstein 1973). This represented substantial evidence for the kinds of differences in the meaning-making resources of social classes that Bernstein (1971) had postulated. Such studies have continued, including Cloran's development of rhetorical units to explore aspects of context-dependence and Williams' study of semantic variation in children's joint book reading (Hasan et al. 2007).

Phase I was thus characterised by two principal relations between SFL and code theory. One involved mutual inspiration in viewing their respective objects of study: code theorists began thinking about sociology in linguistic terms and systemic functional linguists began thinking about linguistics in sociological terms (Bernstein 1995). The other involved adaptation of concepts from Bernstein's early sociolinguistic framework to analyse what came to be known as 'semantic variation' and, as a result, the development of more powerful linguistic tools with which to analyse variation in meaning. This phase not only continues to bear fruit, but also laid foundations for decades of exchanges between code theory and SFL that reaches to the current day.

Phase II: theorising pedagogy

During the early 1990s, a second phase of interaction emerged involving the literacy work of the 'Sydney School' (Rose and Martin 2012) and Bernstein's (1977, 1990) theorisation of pedagogic discourse. The exchange centred on the concern of scholars in Australia, including J.R. Martin, Joan Rothery and Frances Christie, with developing a genre-based literacy pedagogy. This pedagogy moves beyond the false dichotomy of didacticism versus progressivism that dominates educational debates in the Anglophone world. The 'teaching/learning cycles' designed to implement this pedagogy enable teachers to integrate guidance, interaction and student creativity through clear stages of interaction (deconstruction, joint construction, individual construction). The aim is for students to gain control of the genres that they must read and write if they are to progress successfully through their formal education and working lives (see Gardener, this volume).

Genre-based pedagogy initially grew out of the language-based theory of learning developed by Halliday (1993) and was strongly influenced by Painter's (1989) research on child language. In terms of dialogue with code theory, Sydney school scholars drew on Bernstein's (1977) concepts of 'classification' (that is, the strength of boundaries between contexts or categories) and 'framing' (the strength of control within contexts or categories) to reflect productively upon shifts made by teachers and students as they moved through the cycles (Martin 2011). These concepts also helped to conceptualise the ways in which genre-based pedagogy drew on the strengths and avoided the limitations of both traditional and progressivist pedagogies (which Bernstein conceptualised as 'visible' and 'invisible' forms of pedagogy) to empower students, many of whom were otherwise denied access to the bases of educational success (Martin 1999).

A second point of dialogue arose from the reception that genre-based pedagogy encountered as it challenged both traditional and progressivist approaches to literacy pedagogy. Proponents became increasingly puzzled by the highly negative responses of a range of commentators. For members of the Sydney school, Bernstein's (1990) account of how

pedagogies are sponsored by social groupings whose coding orientations they propagate helped to explain this negative response, while his typology of pedagogies positioned their work as 'subversive' for existing social inequalities. As Martin (2011: 38–9) described:

> We knew as an issue of social justice that we were attempting to redistribute the literacy resources of the culture, so that working class, migrant and indigenous learners excluded by traditional pedagogies and further marginalized by progressive ones could access the powerful forms of discourse they needed to renegotiate their position in society. But until studying Bernstein we did not understand the traditional and progressive debate as a struggle over education between factions of the middle class, and our own 'othered' position in relation to these debates. Bernstein's topology of pedagogies immeasurably clarified our stance and the friction we caused and heartened us greatly in our determination to make our political project succeed.

Phase II thus involved Sydney school scholars 'learning to think sociologically about educational linguistics' (Martin 2011: 40). However, in contrast to phase I, the influence was less mutual. At the time, code theorists knew little of Sydney school work, at least until a 1996 conference at the University of Melbourne organised by Frances Christie (1999) at which Bernstein was a keynote speaker. One reason for this was the geographical distance between the main centres of each theory: principal players were not in close proximity. Moreover, the sociology of education in the United Kingdom was under sustained attack from a series of Conservative governments, leading many sociologists to focus on local survival and discouraging engagement with interventionist research. Nonetheless, the pedagogic work of SFL has continued productively (Rose and Martin 2012; Martin and Doran 2015), providing foundational knowledge and values integral to the training of many linguistic scholars who became central to subsequent exchanges.

Phase III: laying foundations

Energised by two interdisciplinary conferences held at the University of Sydney in 2004 (Christie and Martin 2007) and 2008 (Christie and Maton 2011), a third phase of exchange focused on questions of disciplinarity. This exchange explored the different forms taken by intellectual and educational fields in terms of what Bernstein (2000) conceptualised as 'knowledge structures' and their expression through semiosis – specifically – the register categories of field (accounting for what is happening or being discussed) and mode (what role language and other semiotic systems are playing), as conceptualised by Martin (1992) – and the role of grammatical metaphor and technicality (Martin 2007). This phase gave rise to a renewed dialogue, and raised questions that laid foundations for the intense collaborations that were to follow in phases IV and V.

SFL attempted to come to grips with the semiotic basis for knowledge structures, and thereby to develop the tools to make this visible in linguistic and multimodal texts. However, it became clear that the dichotomous types offered by Bernstein's (2000) model – *vertical discourse* and *horizontal discourse* to conceptualise everyday and academic knowledges; *hierarchical knowledge structures* and *horizontal knowledge structures* to conceptualise different kinds of academic knowledge – needed development. SFL posed questions of code theory as attempts to enact the concepts in research quickly foundered. While good to think with, the concepts proved less useful to analyse with: they were pregnant with questions that required theoretical development to answer (Maton 2014b). Put simply, their defining

characteristics were vague or allusive, and the organising principles underlying discourses and knowledge structures were untheorised. The need, then, was for concepts that built on these ideas to excavate the organising principles of different knowledge practices and which could be used in substantive studies. However, the raising of such questions among protagonists once again in close personal contact testify to the significance of this phase. Scholars of each theory were seriously engaging with ideas from the other framework, and engaging in genuine dialogue over how those ideas could help to solve substantive problems of research and practice. This phase thereby prepared the way for a period of dramatic expansion and intensification in exchanges between SFL and what was becoming a revitalised code theory.

Current collaborations

Phases IV and V of exchanges have been characterised by shifts in the focus, form and dynamic of exchanges that mark both new developments and a return to origins. These phases involve Legitimation Code Theory, which extends and integrates Bernstein's framework to provide new tools, foci and avenues of exchange. At the same time, LCT has enabled the enrichment of existing dialogues and involved a return to the kind of intense dialogue that underpinned phase I. This continues a tradition of renovation. Development within each theory has repeatedly refocused exchanges between theories. From the viewpoint of SFL, the emergence of Halliday's functional grammar aided phase I of dialogue with Bernstein's code theory, which in turn sparked its further development and the semantic descriptions of Hasan, Cloran and others. The development of genre by the Sydney school sparked a different form of engagement with code theory in phase II. The search for a semiotic characterisation of disciplinary practices in terms of field, utilising Halliday's development of grammatical metaphor, provoked further interest in code theory by SFL scholars in phase III. Similarly, each phase was shaped by the evolution of code theory, including introducing the concept of 'coding orientations' (phase I), the theorisation of pedagogic discourse (phase II) and the modelling of 'knowledge structures' (phase III).

Phases IV and V have similarly been marked by internal evolution of each theory, although with a difference. The development of code theory into LCT not only introduces new concepts that evoke further phases of exchange, but also does so by extending and integrating concepts central to established phases, shedding fresh light on their concerns. For example, the concepts of 'specialisation codes' from LCT extend and integrate Bernstein's 'classification' and 'framing' (Maton 2014b). They effectively ask whether strengths of classification and framing refer to *epistemic relations* (between knowledge practices and their objects) or to *social relations* (between knowledge practices and their subjects). Similarly, the LCT concept of 'knowledge–knower structures' expands Bernstein's ideas to embrace not only knowledge, but also knowers (Maton 2014b). In so doing, they reveal new modalities of organising principles underlying dispositions and practices, both generating new issues for dialogue and reinvigorating notions of coding orientation, pedagogic discourse and knowledge structures.

A second kind of reinvigorated return is the extent to which SFL and LCT are being used together to analyse the same data. This partly results from a renewed proximity of key protagonists. Martin (2011: 40) emphasises the emigration of the creator of LCT, Karl Maton, to Sydney in the late 2000s as helping to catalyse the kind of adoption and adaptation of concepts within empirical studies that characterised research in phase I. The relationship between SFL and code theory is no longer one of distant influence or exchanging publications, but rather

is characterised again by constant creative tension. One result of the growth of studies using both theories is the emergence of a new generation of scholars fluent in both frameworks, precipitating a potential expansion in future dialogue.

Phase IV: specialisation

From the perspective of code theory, phase IV of exchange centres on the LCT dimension of Specialisation, while phase V involves the LCT dimension of Semantics (Table 38.1).[1] In terms of substantive research, the distinction between phases is becoming less clear: many studies use both LCT dimensions alongside SFL. Nonetheless, it aligns with the temporal development of these concepts and roughly aligns with differences in foci for SFL. Phase IV has continued the existing dialogue over education, as illustrated by a growing number of studies that use both theories to explore such issues as academic writing (Hood 2016), popular education (Vidal Lizama 2014), and second-language learning (Meidell Sigsgaard 2013). These studies reveal how legitimate meaning-making has different bases across academic disciplines that require distinct complexes of semiotic strategies. However, education has not been the only focus; another line of enquiry, which we shall discuss here, explores the nature of identity and affiliation in wider society.

Research on coding orientation in phase I had shown that different social groups possess different repertoires of semiotic strategies for communication. Research on identity in phase IV builds on that work by mapping the breadth of resources deployed by people in different situations to understand the distinct personae being performed. This focus on identity and affiliation has utilised more recently developed systems of SFL, such as APPRAISAL (Martin and White 2005) and the hierarchy of individuation/affiliation (Martin 2010, 2012). In similar fashion to research in phase I, many identity studies are utilising LCT concepts as the broader theoretical scaffold with which to interpret and explain findings, and SFL as a means of translating the textual data into forms understandable by those LCT concepts.

Catalysing this research on identity has been a major study by J.R. Martin, Paul Dwyer and Michelle Zappavigna focusing on the restorative justice system of youth justice conferencing in New South Wales, Australia. The research explores how these conferences re-affiliate offending young people into the community by examining their staging, the roles assumed by participants, and the meanings articulated across language and gesture (Martin 2012). Certain participants, such as the young offender or his or her mother, have a range of options in the identities that they can perform. While giving testimony, for example, the young offender can be more or less forthcoming with his or her evidence and more or less remorseful for his or her actions, and these options affect his or her interactions with other participants in the conference. However, as the study reveals, there is no single semiotic feature that characterises each identity; rather, personae are construed through complexes of semiotic phenomena that cut across linguistic and paralinguistic systems. To capture the bases of these multifaceted practices, the investigators adapted 'specialisation codes' from LCT (Maton 2014b). As shown in Figure 38.1, the specialisation plane plots a continuum of strengths of epistemic relations (ER) between practices and their object or focus against a continuum of strengths of social relations (SR) between practices and their subject, actor or author. Each relation may be more strongly (+) or weakly (−) bounded and controlled or, simply put, more or less emphasised as the legitimate basis of practices. Together, these strengths generate four principal specialisation codes and a topological plane with infinite gradations of position.
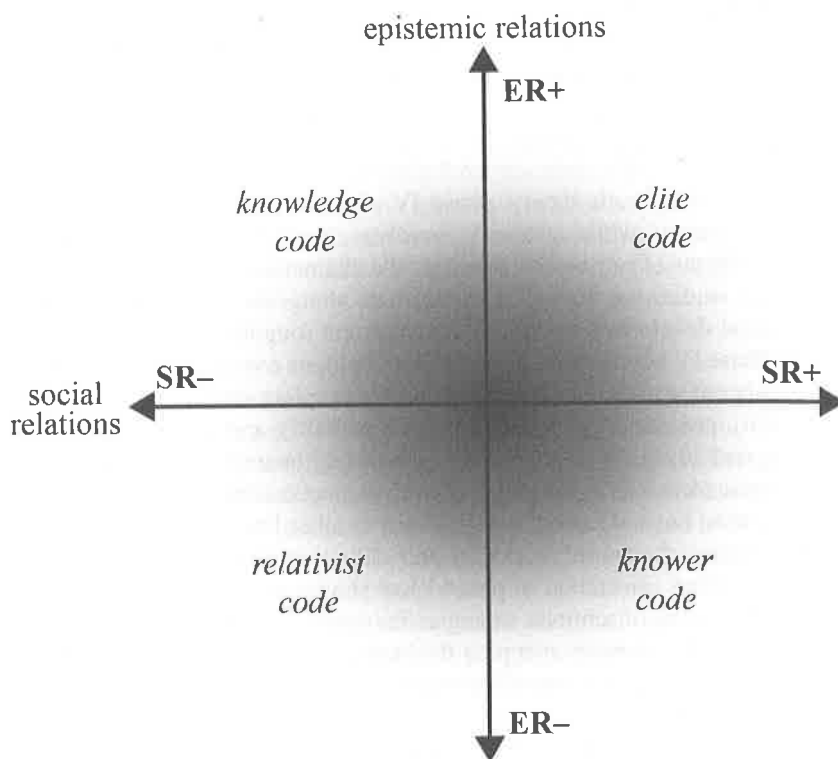
Figure 38.1 The specialisation plane
Source: Maton (2014b: 30)

Linguistic analysis of testimony by young offenders used a wide range of tools across each of the ideational, interpersonal and textual metafunctions. This produced a large set of results that were not self-evidently related. To collect these results into distinct personae, findings were analysed in terms of epistemic relations and social relations. In this particular object of study, epistemic relations (ER+/−) were realised by the ideational meanings of how detailed and forthcoming the young offender was in his or her testimony, and social relations (SR+/−) were realised by the interpersonal meanings of the degree of remorseful attitude expressed by the young offender. By plotting strengths of the ideational (how forthcoming) and the interpersonal (how remorseful) meanings on the specialisation plane, identities were generated to categorise the personae of young offenders. Four principal personae were generated: the *guilty*, who is forthcoming, but not remorseful (ER+, SR−); the *prodigal*, who is unforthcoming (often unable to remember the incident owing to intoxication at the time), but remorseful (ER−, SR+); the *redeemed*, who is both forthcoming and remorseful (ER+, SR+); and the *accused*, who is unforthcoming and only reluctantly remorseful (ER−, SR−). In LCT terms, these are analogous to knowledge codes, knower codes, élite codes and relativist codes, respectively (Figure 38.1). Thus, to develop a generalisable understanding of different performed identities, the study used SFL to translate data into terms that could be engaged by concepts adapted from LCT. This, in turn, made visible the organising principles of personae: strengths of epistemic relations and social relations.

Put another way, SFL revealed the complex array of semiotic resources marshalled by actors to achieve the personae uncovered by adapting LCT.

Such research on identity complements the fast-growing body of educational work using the Specialisation dimension of LCT alongside SFL to build on phases II and III of exchanges. In this research, different relations between the theories often obtain, although studies typically use SFL concepts to explore the complexes of linguistic resources enacted by actors to achieve knowledge practices the organising principles of which are revealed by Specialisation.

Phase V: semantics

The recent advent of phase V (see Table 38.1) has further intensified exchanges between SFL and LCT, again provoking both theories to elaborate their conceptual frameworks. This phase was catalysed by the LCT dimension of Semantics, which is centred on the concepts of 'semantic gravity', or context-dependence of meaning, and 'semantic density', or complexity of meaning (Maton 2014b). These concepts have been used in conjunction with a variety of concepts from across SFL to study a range of issues, including 'critical thinking' (Szenes et al. 2015) and ethnographic writing in the humanities (Hood 2016), and in ongoing PhD studies into museum exhibitions, digital media and mathematics in physics.

Two major studies of cumulative knowledge-building in secondary school classrooms exemplify the intimate and intense nature of dialogue characterising this phase: the Disciplinary, Knowledge and Schooling (DISKS) project, involving J.R. Martin and Karl Maton; and the Pedagogies for Knowledge-building (PEAK) project, led by Karl Maton, J.R. Martin, Len Unsworth and Sarah Howard. These projects have engaged a number of researchers, and have meshed with a series of doctoral studies and other research across linguistics, sociology and education. Both projects explore the basis for knowledge-building through language, educational technology and other multimodal communication through lessons in different subject areas (Martin and Maton 2013). Both projects have brought together LCT and SFL scholars in complementary analyses of shared data. This involves a process of recurrently alternating between parallel analyses, in which each theory separately explores the same phenomenon, and joint analyses, in which results of analyses are related together, raising issues for further parallel analyses.[2]

In contrast to existing phases, here, concepts from one theory are not being adapted by scholars from its companion approach, and neither theory is acting as a means of translation between data and concepts from the other theory. Rather SFL and LCT operate side by side as analytic frameworks providing complementary analyses that are then integrated. Put simply, SFL is enacted to analyse linguistic practices, LCT is enacted to analyse knowledge practices and these are related together to more fully explore the shared problem-situation. Such complementary analyses have not only offered new insights into classroom practice, but also posed questions to each framework, propelling theoretical innovation. As protagonists state:

> [C]ollaborative analysis of shared data raises questions with an immediacy unknown in dialogue at a distance. 'That to be explained' is in plain sight – there is less space for uncertainty or ambiguity, less opportunity to obfuscate or fudge. Under such circumstances, questions can quickly reveal the limits of concepts – they put them to the test.
> *Maton et al. 2016: 108*

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The resulting theoretical innovation is illustrated by the LCT notion of 'semantic waves' (Maton 2013, 2014a). Semantic waves involve recurrent movements in the strengths of *semantic gravity* (between relatively decontextualized and context-dependent meanings) and *semantic density* (between simpler and more complex meanings) of knowledge practices. A growing number of studies suggest that generating semantic waves is a key to cumulative knowledge-building (Maton 2014a). SFL analysis reveals that such shifts involve a complex coordination of linguistic resources – including, but not limited to, technicality, grammatical metaphor, appraisal and periodicity – and that the selection and relation of these resources vary across subject areas. Thus the phenomenon of semantic waves revealed by LCT cuts across the metafunctions and strata of SFL. That there is no simple equivalence between the concepts of each theory is proving productive. In this case, the need to capture the linguistic resources at play in these complexes of semiotic phenomena so as to understand cumulative knowledge-building have provoked SFL scholars to rethink such fundamental concepts as the register variables field and mode (Martin and Matruglio 2013; Martin 2016).

Martin argues that linguistic theorisation of context-dependence and condensation of meaning is not as well defined or clear as many SFL scholars might assume, and that it varies widely among studies (Martin and Matruglio 2013; Martin 2016). To provide a more comprehensive account, Martin proposes the overarching concepts of 'presence' and 'mass' as linguistic analogues of semantic gravity and semantic density. *Presence* concerns context-dependence and involves *implicitness* (concerning textual resources, such as exophoric reference to the outside situation), *negotiability* (mobilising interpersonal resources, such as the arguability of a proposal or proposition) and *iconicity* (the degree of ideational grammatical metaphor). *Mass* concerns condensation of meaning and accounts for variation in the degree of meaning invoked by an instance of semiosis, embracing *technicality* (distillation of ideational meaning), *iconisation* (condensation of interpersonal meaning) and *aggregation* (consolidation of textual meaning). The concepts of 'presence' and 'mass' thus characterise the full possible array of linguistic resources potentially at stake during changes in the semantic gravity and the semantic density of knowledge practices. Not all resources may be relevant at any one time; which aspects of presence and mass are activated in any given situation is thus a matter for empirical research. While detailed discussion of these concepts is beyond the scope of this chapter, the key point here is that differences between LCT and SFL are productive: concepts from one theory highlight issues previously obscured by the architecture of the other theory.

This is not a one-way street. Joint analyses of classroom practices with SFL underlined the need for more refined means of relating the concepts of semantic gravity and semantic density to empirical data (Maton et al. 2016). To this end, multilevel typologies have been developed that provide fine-grained categories for distinguishing the realisations of different strengths of semantic gravity and semantic density at the level of wording, word grouping, clausing and sequencing in English discourse (Maton and Doran 2016a, 2016b). These 'translation devices' allow LCT to engage with fine-grained analysis of discourse to an extent not previously available in code theory. By exploring these features of knowledge practices within the nature of discourse, they are bringing LCT analyses closer to the kind of detailed exploration of language characteristic of SFL – and the insights offered by each approach are thus able to be more closely related. Similarly, Martin's mass and presence allow SFL to mobilise its vast descriptive array to understand degrees of meaning condensation and context dependence in a more powerful way than ever before. Once more, major advances in each theory have been provoked by engagement with its companion. Moreover, developments driven by close, collaborative analyses of shared data are thereby providing a basis for even closer and more collaborative analyses.

A shared future

What enables this long-standing dialogue to remain fresh and fruitful? Space precludes discussion of the diverse theoretical attributes that have been described as shaping this dialogue (Hasan 2005; Christie and Martin 2007; Martin 2011; Maton 2012). Here, we shall simply highlight how both theories are 'realist', 'relational' and 'risk-taking'. These '3-Rs' describe interrelated features of their ontologies, internal structures and external relations to data; as such, they represent the minimum essential (although not sufficient) characteristics for fecund collaboration.

First, both theories are based on *realist* ontologies that move beyond empirical features to explore underlying organising principles. Neither theory is content with providing empiricist commentary on specific instances. Rather, each seeks to develop means for moving between concrete empirical descriptions and abstract theorisations, to enable findings from different studies to be related and mutually informative.

Second, the approaches both comprise *relational* frameworks that combine typologies and topologies and embrace change. For both theories, semiotic and sociocultural practices exhibit properties, powers and tendencies that are emergent from, and irreducible to, their constituent parts. Rather than understanding meaning-making by aggregating interactions among participants, both approaches highlight the multilayered nature of the social reality realised by any substantive instance. Accordingly, their conceptual architecture reflects this relationality in, for example, emerging hierarchies of stratification, instantiation and individuation of SFL (Bateman and Berry, both this volume), and the stratified notions of 'structures', 'codes' and 'devices' in LCT (Maton 2014b).

Third, both theories put concepts at *risk* through close engagement with real-world problem-situations. Their concepts aim for unambiguous relations to their referents, and are created from and for the exploration of real-world data. As such, every substantive study may prove even well-established and core concepts to be inadequate or in need of fundamental overhaul. Data can 'speak back' to theory, demanding clarification, refinement or revision. Neither theory is a museum piece, to be simply glossed or admired; each is continually modified and developed to account for more phenomena with greater conceptual economy.

Looking to the future, the question remains as to where collaboration may be heading. Conceptual developments inspired by exchanges have taken several forms. All phases have highlighted how each theory may allow its companion to reflect on its own object of study in fresh ways, to think sociologically about linguistics and linguistically about sociology. They have also demonstrated how dialogue catalyses intellectual advance by pointing towards issues requiring further development. More recently, though, innovation is taking a new direction in the form of conceptual development, which can act as a bridge between the approaches. The creation of 'translation devices' for enacting the LCT concepts of semantic gravity and semantic density in analysis of English discourse represents a significant step towards enabling closer joint analyses of data. Conversely, the SFL concepts of mass and presence may offer a means of connecting to those concepts. Martin and Maton (in personal communication) have suggested how the concepts from each theory relate to one another. If we consider each theory as representing a universe of meanings in which individual concepts gain meanings from relations to other concepts and to referents, then 'presence' and 'mass' function as portals between these universes, connecting a wide raft of systems in SFL to 'semantic gravity' and 'semantic density' in LCT. Conversely, the LCT concepts act as portals from the opposite direction by relating their diverse realisations in sociocultural practices across different objects of study to mass and presence in SFL. Each set of portals

is sufficiently distanced both from empirical data (thus not too embedded in the phenomena specific to that theory) and from the fundamental principles at the core of each theory (such as strata and metafunction in SFL) to allow movement from one theory toward the other. By moving from the diverse array of linguistic resources to 'mass' or 'presence', and then, through these portal concepts, to 'semantic density' or 'semantic gravity' (and vice versa), one moves from one theoretical universe to another. One is never in both at the same time: the concepts are not a blend of both theories, but rather a means of enabling communication. Such portal concepts represent an exciting possible future for interdisciplinarity: the emergence of genuine means of translation that enable inter-theory movement without theoretical pidginisation or elision. This raises the tantalising question of the possibility of Janus-faced concepts designed specifically to operate in both frameworks. One must always remain mindful that the theories are complementary precisely because of their differences, but these concepts may serve to inspire further developments.

After such positivity, we should highlight that collaboration offers much potential for criticism, confusion and conflict. Such interdisciplinary developments can be terrifying for actors whose status and identity are firmly rooted in the existing state of a theory rather than in the exploration of problem-situations. Such developments can lead to claims that disciplinary purity is being diluted. Dialogue can evoke criticisms that LCT is overly influenced by SFL or SFL research using LCT is overly sociological. Such policing, however, is more concerned with struggles over status than with explanatory power. Nonetheless, criticisms highlight several potential pitfalls to be avoided. These include unclear blendings of the theory, for example where the ideational metafunction of SFL is taken as equating to epistemic relations in LCT, or the interpersonal metafunction is taken as equating to social relations. Although the former concepts may provide insight into one aspect of realisations of the latter concepts within a specific problem-situation, as explored in studies of restorative justice, they are not identical. There is also the potential for the object of study of each theory to be reduced to that of the other – that is, knowledge practices to linguistic practices or vice versa. The gains offered by using the two theories flow not from where one displaces the other, but from where they complement one another. As we have seen, this complementarity provokes creative tension, pushing each theory to develop greater understandings.

The collaboration between SFL and LCT is ongoing, pushing into areas that extend well beyond language in classrooms. Current work is exploring the potential of images in building knowledge, probing the use of mathematics in moving between abstracted theory and tangible instances in the natural sciences, and combining complementary analysis of gestural semiosis in SFL and embodied knowledge in LCT to understand the meaning potential of bodily movement. Each of these areas and many more are being analysed in interdisciplinary studies, with the two theories working in intensive collaboration, offering complementary perspectives. There are still, however, many areas of SFL that have yet to be explored in relation to LCT and there are also as yet relatively underused conceptual dimensions of LCT that will gain much from dialogue with SFL. All of these have the potential to push both theories into new realms. Side by side, the theories continue to march forward into the unknown together.

Notes

1 LCT comprises five 'dimensions', each exploring different organising principles of practice (Maton 2014b).
2 See Maton et al. (2016) on this methodology.

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