
Knowledge and knowers by Karl Maton

A review essay

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Fiona Jackson

Abstract

This article outlines selected aspects of Legitimation Code Theory (LCT), as presented in Maton's book *Knowledge and Knowers: Towards a realist sociology of education* (2014), and considers their usefulness to the field of education research, in particular, for language education. An introduction to key LCT concepts is provided highlighting their analytic power for the investigation of the varying forms of educational knowledge structures, knower roles and what forms of pedagogic practices promote or inhibit cumulative learning. The notion of 'context', in relation to LCT's concept of semantic gravity and decontextualised knowledge forms, is considered alongside Cummins' notions of contextualised and decontextualised language. The importance of further research into what is meant by 'context' in relation to pinpointing the nature of contextualised and decontextualised knowledge, and the nature of forms of cumulative learning is raised.

Knowledge and Knowers: Towards a realist sociology of education (2014) distils the evolution of Legitimation Code Theory (LCT), while emphasising issues of knowers and their practices. The sweep of the book is large, complex and theoretically dense, addressing more issues than can be usefully considered in a single article. Areas such as Maton's discussion of LCT's foundation in Bourdieu's field theory and Bernstein's code theory, while important to engage within order to understand fully the theoretical lineage of LCT, will not be discussed in detail here. I focus on those aspects that seem most immediately provocative and generative for research into pedagogical practice (using issues in relation to language education as exemplars) – the dimensions of Specialisation and Semantics. However, I begin with brief contextualisation of these dimensions within LCT as a whole, sketching its roots in the thinking of Bourdieu and Bernstein.

LCT locates itself within a social realist paradigm, drawing particularly upon the sociological theories of Pierre Bourdieu and Basil Bernstein, while pursuing the goal of building a sociology of knowledge that addresses the gap of 'knowledge blindness' (Maton, 2014) in educational research. This gap,

Maton argues, is the result of prior intensive research foci on *relations to* knowledge, for example, as in relations of social power to knowledge. Consequently, knowledge itself is under-researched and constructing a sociology of knowledge requires working with an understanding of knowledge as something *real*, with different types of knowledge varying in structure, properties and effects. However Maton also argues that taking knowledge seriously is no license to valorise it at the expense of forms of knowing rooted in knower practices, hence the focus of the book on knowers as well as knowledge.

Legitimation Code Theory¹ addresses issues of social practice, aiming to identify and articulate the underlying organisational principles of social fields. It sees people as agents operating, both collaboratively and competitively, in fairly independent, yet interlinked social arenas. Drawing on Bourdieu, it argues the goal of much social practice is to achieve maximum relational gain, in terms of social control, position and prestige. Each field works uniquely, with distinctive types of prestige and sets of resources. Yet beneath the particularities lie similar generative principles which LCT works to excavate and understand. Currently LCT has identified dimensions of Autonomy, Density, Temporality, Specialisation and Semantics. *Knowledge and Knowers* focuses on the educational field, setting out how the dimensions of Specialisation and Semantics contribute to the building of a sociology of knowledge and knowers. Maton argues that knowledge in itself is under-researched, but cautions that taking it seriously is not to valorise it at the expense of forms of knowing rooted in knower practices.

Located within a social realist paradigm, LCT understands knowledge as neither purely cognitive nor social. Maton argues against construing knowing only as inner mental processes, or on focusing attention solely on knowledge as social power. Intensive scrutiny of relations *to* knowledge in educational research has led to the serious gap of ‘knowledge blindness’ (Maton, 2014). LCT assumes we build knowledge collectively as well as individually, socially as well as cognitively. New knowledge arises out of extant knowledge that has been crafted and evaluated by socially contingent actors engaged in relationally strategic manoeuvres within particular fields. Bernstein’s code theory is harnessed to sharpen the analytic focus provided by Bourdieu’s field theory. Code theory helps unravel how knowledge structures

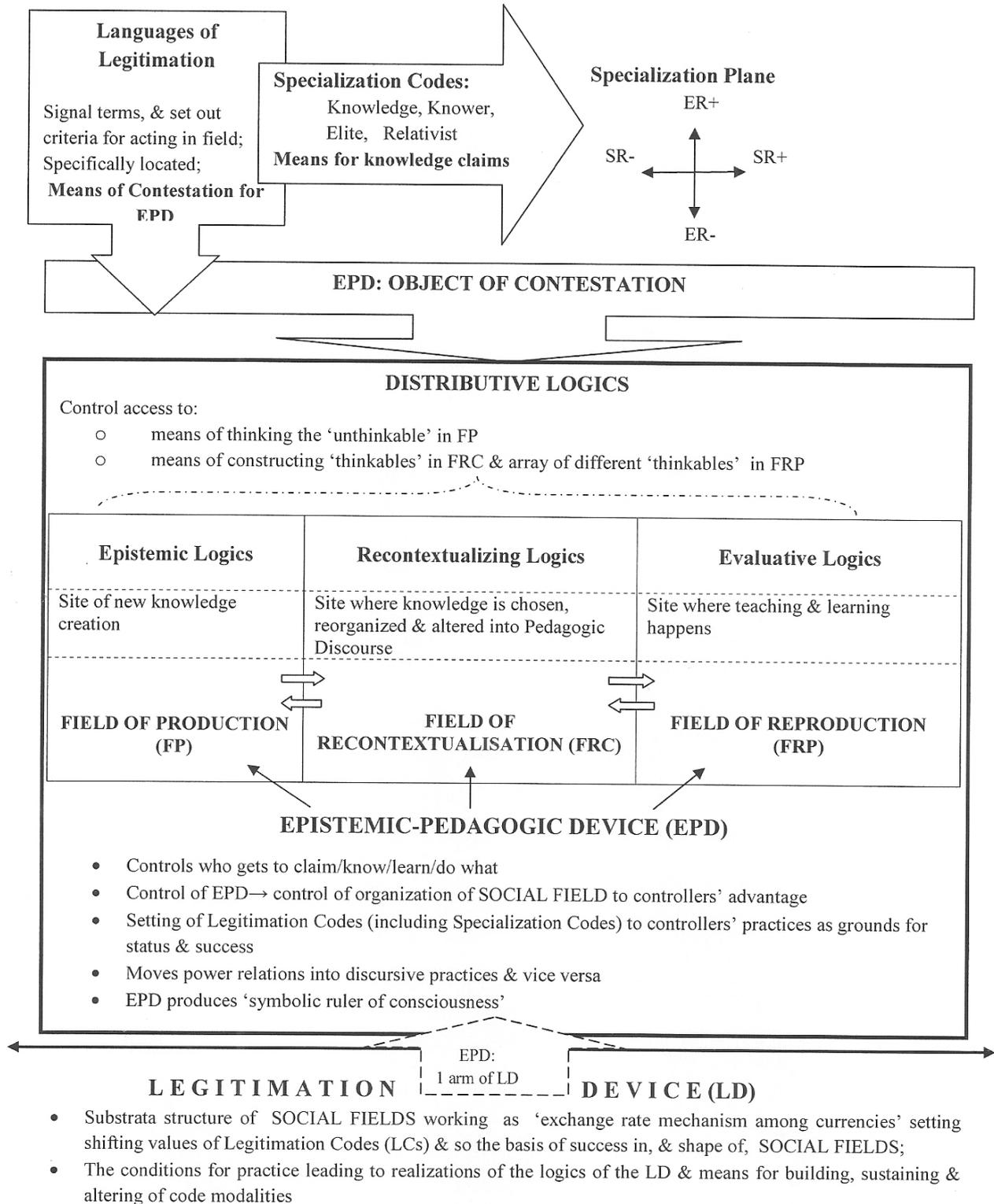
¹ For more information on Legitimation Code Theory see the LCT website: www.legitimationcodetheory.com

impact upon fields, focusing attention on knowledge as the medium of the educational message; on how knowledge practices themselves are structured. By extending Bernstein's 'pedagogic device' into the 'epistemic-pedagogic device' Maton provides the means to analyse knowledge and knower practices across intellectual, curricular and pedagogic fields. LCT thereby extends, enlarges and synthesises selected concepts from both field and code theory, developing rather than displacing them; establishing an explanatory framework for the cumulative theorisation of the underlying organisational principles of knowledge and knowing.

While Maton's exposition of LCT, via its prior chronological development, illustrated with numerous examples from substantive empirical studies, is a strength I hankered for a clear synoptic overview of the inter-relationship of the components of LCT. Figure 1, on page 3, shows my initial 'mapping' of just one set of legitimation codes – those from the Specialisation dimension. The diagram reads most logically from the bottom up.

Maton posits the Legitimation Device (LD) as the deep, generative level of organisational principles regulating all social fields, the agents operating within them, and their practices. He uses the metaphor of a currency exchange for its actions, revealing partial roots in Bourdieu's notion of 'capital'. Thus actors enter and operate in social fields with varying forms and quantities of social currency, or 'value'. The Legitimation Device controls how people interact and exchange their social currencies. Those with maximum power over the Legitimation Device regulate which Legitimation Codes have most power, and thus what counts as legitimate within the fields. The operations of the Legitimation Device thus form social fields as active 'fields of possibilities' (2014) in perpetual flux. Actors within these fields work both together and against each other in order to leverage the largest gains in attaining the most prestigious relational positions, and in controlling what counts as prestige. The practices of actors, which can be both explicit and tacit, comprise languages of legitimation that count as competing claims for legitimation.

Figure 1: Interrelations of Legitimation Device and Epistemic-Pedagogic Device and Specialisation Codes (Jackson’s ‘Mapping’)



The ‘epistemic-pedagogic device’, one arm of the LD, pertains to issues of knowledge and education. Its revision and extension of Bernstein’s ‘pedagogic device’ provides a way of understanding arenas of social struggle across three fields of practice: the fields of production, recontextualisation and reproduction. The field of production is the site of the genesis of new knowledge, of the ‘unthinkable’ – what people such as scientists, academics, poets, artists and inventors generate. The field of recontextualisation is the site for the selection from the knowledge of the field of production, its rearrangement and transformation into forms for pedagogic communication. The field of reproduction is the site where the teaching and learning of recontextualised knowledge happens. Each field operates according to its own specific logics, meaning it is problematic to conflate the forms of operation of fields as identical. However, individuals such as university academics may operate across all three fields. For example, an applied linguistics lecturer may conduct original research on how language is deployed differently in corporate meetings and written documents arising from such meetings. This may contribute to the development of theories of corporate communication and the relations between spoken and written discourses (field of production). The lecturer may write a textbook on corporate communication for undergraduate university students (field of recontextualisation), and then may teach in an undergraduate course on corporate communication (field of reproduction), focusing on strategies for effective communication in meetings and written documents. A lecturer setting out to theorise their practices in each field, would need to work with a conscious understanding that each field operates according to its own logics.

The shift from Bernstein’s conception of field ‘rules’ to Maton’s of field ‘logics’ seeks to prevent false claims that they propose practices as deterministically rule governed. The mapping of the EPD also highlights that knowledge moves in many paths, with the bi-directional arrows showing recontextualisation happening between fields. The right-to-left arrows indicate that artifacts from recontextualisation fields can be intellectualised or absorbed into production fields as a part of ‘prior’ knowledge that acts as ‘raw material’ for the genesis of fresh knowledge. For example, student essays produced within a corporate communication course may be the subject of research into knowledge building and/or communication processes within the field of communication education. Insights from such research may contribute to the building of communication and genre theory. In addition, educational knowledge (from the reproduction field) can be re-curricularised (extracted from, re-directed, moved to) as curricular product of recontextualisation

fields. For example, following analysis essays by corporate communication students may be transformed with theorised annotations and wrap around text relating salient aspects of genre theory to the essays, and included in a book on academic writing for communication students.

Maton's other key revision of Bernstein's model is to argue that distributive rules do not control the practices of the field of production. While Bernstein's model asserts that every field has its own distinct practices, the unique practices of the field of production remain unspecified. Maton further argues that the rules controlling the field of production are not mainly distributive, but that distributive logics relate to all fields of the EPD, reaching across the activities of the whole arena. Distributive logics illuminate that "a precondition for playing the game is entering the arena" (2014, p.51). This implies that the EPD regulates not only who has access to 'thinking the unthinkable' (means to control, as well as generate, the genesis of new knowledge) via participation in production fields, but also who has access to the means of constructing 'thinkables' in recontextualisation fields and to an array of different 'thinkables' in reproduction fields. Thus, if epistemic, recontextualising and evaluative logics regulate the various 'whats', then distributive logics regulate "who enjoys access to which 'whats'" (2014, p.51). Therefore the EPD sets out the key components and deep principles underlying people's contestations to control which criteria of achievement prevail and the 'conversion rates' among them. Consequently, the people who control the EPD control the 'ruler of legitimacy' in key social arenas and secure the greatest reach and impact for their own location in status hierarchies.

The idea of 'languages of legitimation' illuminates both the sociological nature of knowledge practices and the epistemological nature of potentially legitimate knowledge claims. Languages of legitimation underpin the practices of actors and simultaneously count as claims for the legitimacy of their actions, or, "for the organising principles embodied by their actions" (2014, p.24). They constitute the grounds for contesting claims to scarce supplies of prestige and material goods. Thereby they are positions strategically adopted with the purpose of maximising the advantage of the locations of agents inside a "relationally structured field" (2014, p.24). They signal the terms and criteria for acting in a field and are specifically located within particular versions moulded by the actors' positions and perspectives. So languages of legitimation constitute organising principles that have consequences. Firstly their innate compositions are neither uniform nor

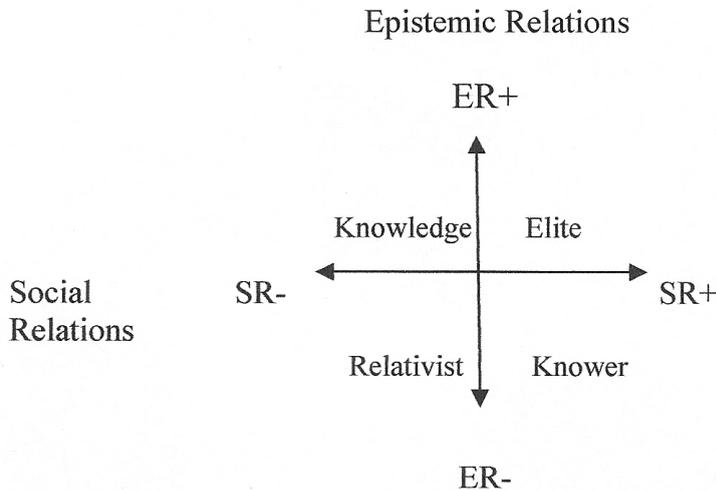
impartial. Secondly, the structure of a language moulds the potential of what can be communicated. This conception of languages of legitimation facilitates a focus both on analyses of ‘relations to’ knowledge practices and analyses of ‘relations within’ knowledge practices.

In relation to knowledge practices languages of legitimation are realised (in one dimension) as epistemic relations and social relations that constitute specialisation codes. Specialisation refers to the reality that all human practices and beliefs are both:

- (a) about, or positioned towards something, thus involving relations to objects of focus, and
- (b) by someone, thereby concerned with relations to subjects.

In highlighting the co-existence of these elements within all human activity, Maton facilitates a conceptually whole focus, signalling the salience of attending both to issues of knowledge in itself, and identity and social formation. Maton analytically differentiates between ‘epistemic relations’ (referring to relations between practices and their objects) and ‘social relations’ (referring to relations between practices and their subjects or originators). Epistemic relations illuminate issues of what can legitimately be named as knowledge, while social relations focus on who can assert themselves as legitimate knowers. These concepts are deployed using Bernstein’s notions of classification and framing. Classification refers to the strength of boundary maintenance between situations. Framing refers to the location of control inside contexts. Stronger framing points to greater control from above. Therefore, stronger epistemic relations refer to practices which place firm boundaries and control around what can legitimately constitute objects of study and what procedures may be used. Stronger social relations refer to the placement of strong boundaries and control around who may be recognised as legitimate knowers.

Maton argues against dichotomising typologies in educational research, and so visualises epistemic relations and social relations as intersecting continua that generate a Cartesian plane which produces a topological space comprising four specialisation codes – knowledge, elite, knower, relativist as set out in Figure 2 below:

Figure 2: Cartesian Plane – Specialisation Codes

This topological space provides possibilities for separate variations in the strength of epistemic relations and social relations. The mapping of infinite numbers of positions along continua of relative strengths is thus possible, along with the tracing of shifts of position within quadrants.

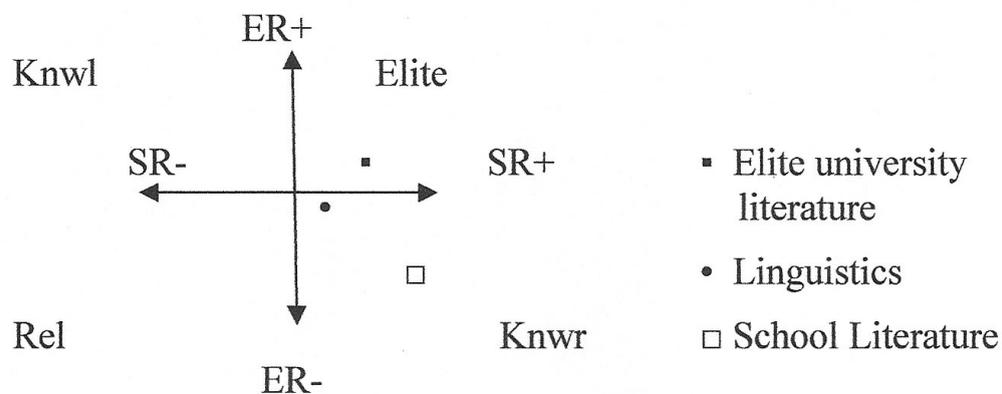
Knowledge codes are those which strongly mark off what counts as legitimate objects and/or methods of study, while backgrounding the salience of personal attributes of those who do the studying. This is schematised as ER+ SR-. Physics is typically an example of such a code, where specialised knowledge of particular objects of study using strongly controlled procedures is stressed. In principle, there is no social restriction on who may claim legitimate physics knowledge, as long as they master the accepted procedures for knowledge building in physics.

In contrast, knower codes (SR+ ER-) ground assertions of legitimacy in particular kinds of knowers. There is stronger classification and framing of social relations – *who* makes claims is the most important factor in terms of ideal knower traits. Differences between knowers are thus stressed. Wide ranging knowledge assertions, methods and procedures are largely a matter of individual choice. Social knower codes aim to speak the experiences of knowers with truth being established via the ‘voice’.

In the field of reproduction this points to the possibilities of nuanced plotting of variable positions. For example, in relation to English Studies, the study of literature in schools can usually be placed as a knower code, where social

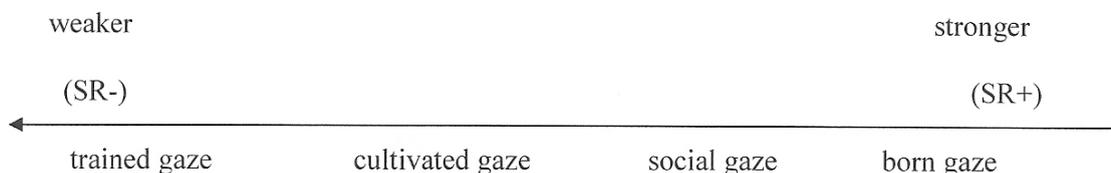
relations predominate in relation to the importance of knowers’ responses to literature (usually through cultivation, developing the dispositions of knowers into a range of possible literary gazes). However, where the focus of study is linguistic, while the placement is still likely to be within the knower code quadrant, it will be much closer to the knowledge quadrant, since the focus will be far more on the knowledge, understanding and analysis of linguistic structures in a highly systematised way and far less on the traits of the knowers. There may well be other possible placements, such as of the study of literature at an elite university. In such circumstances, what you know about English literature may be as important as who you are as a knower – for example, if to count as a legitimate knower you must arrive with extensive reading of classical as well as English literature as foundational knowledge to the further growth of your already cultivated literary disposition. Such an approach would likely be placed within an elite code.

Figure 3: Specialisation Codes – Placement of Literature and Linguistics



Additionally within the field of reproduction, the specialisation plane offers an analytic framework for the nuanced investigation of teaching and learning practices. It allows for tracking of subtle shifts in emphasis of specialisation codes across different aspects of the pedagogic process. It can also facilitate exploration of issues such as the dispositions and practices of teachers and learners, and degrees of code match and code clash between them (see Chen, 2010 for an example from professional education).

Maton further elaborates upon specialisation codes in terms of types of gazes, identifying a continuum from weaker social relations to stronger social relations:

Figure 4: Continuum of Gazes

Trained gazes are those with weaker social relations (SR-) and stronger epistemic relations (ER+) while born gazes are those with much stronger social relations (SR+) and weaker epistemic relations (ER-). Cultivated gazes are those with a somewhat weaker social relations acquired by long immersion that cultivates the legitimate dispositions of the knower. Social gazes are acquired by virtue of one's location in society, such as from one's class position, or one's social category, such as being black or female. Hierarchical growth of knowers can occur through cultivated gazes. That is, an increasing range of knowers can, in principle, be admitted at the base of the hierarchy and can then be socialised into the legitimate cultivated gaze. These ideas therefore potentially provide a shared language through which to explore ongoing contestations surrounding pedagogic issues. For example, suggestive research areas regarding school-based learning of home and additional languages include:

- What is the legitimate gaze of cultivation in particular contexts?
- What are the languages of legitimation for our different home languages as school subjects? How do these compare with each other, and what are the implications of any differences?
- What are the implications of aiming to expand the base of knowers in language education?
- Who are the guardians of the gaze? What is the nature of their legitimation codes?
- Which criteria and pedagogic processes are deployed in the processes of cultivation of legitimate gazes?
- What code clashes are evident in the field (e.g. between policy-makers, curriculum designers, textbook writers, teachers and learners? What are the implications of these clashes?

LCT specialisation codes can be further analysed into 'insights' and 'lenses', offering increasingly delicate discriminations within, as well as between

codes. Space constraints, however, do not permit elaboration of these here – Chapter 9 explicates these distinctions.

A further key concern for Maton is the question of what constitutes, and promotes, cumulative theorising and learning, as opposed to segmented thinking. This is deeply linked to Bernstein's suggestive model of 'horizontal' and 'vertical' discourses (2000). Horizontal discourses are those of everyday, informal knowledge. Vertical discourses are those of specialised, systematic, formalised knowledge. Within vertical discourses, Bernstein then identified two types of knowledge structures. Hierarchical knowledge structures comprise hierarchically organised knowledge systems with clearly principled knowledge, coherently structured and systematically integrated. Horizontal knowledge structures consist of numerous specialised languages, each with specific criteria for specialised modes of analysis. These operate from different assumptions and are segmented from each other. Maton focuses here on developing Bernstein's model to be useful in the field of reproduction. He asks how educational knowledge can facilitate cumulative learning (that is, greater conceptual hierarchisation) as opposed to segmented learning. He argues that segmentalism

[comprising] 'a series of discrete ideas or skills rather than cumulatively building on previously encountered knowledge'. . . 'can constrain students' capacities to extend and integrate their past experiences and apply their understandings to new contexts, such as later studies, everyday lives or future work' (2014, p.107).

Cumulative learning enables transfer of knowledge between contexts and through time, while segmented learning often restricts transfer, leaving learners with knowledge locked within the 'semantic gravity well' of particular contexts. Maton proposes the notions of cumulative learning, semantic gravity and semantic density as key tools to articulate the underlying organising principles enabling understanding of what makes discourses horizontal or vertical, or a knowledge structure horizontal or hierarchical.

Semantic gravity refers to the degree to which the meaning of practices relates to their contexts. Maton elaborates:

This semantic gravity may be relatively stronger or weaker along a continuum. When semantic gravity is stronger, meaning is more closely related to its social or symbolic context of acquisition or use; when it is weaker, meaning is less dependent on its context. One can also describe processes of *strengthening* semantic gravity, such as moving from abstract or generalized ideas towards concrete and delimited cases, and *weakening* semantic gravity; such as moving from the concrete particulars of a specific case towards

generalizations and abstractions whose meanings are less dependent on that context (2014, p.110).

Broadly, then, semantic gravity involves degrees of abstraction and concretisation. A key issue is determining exactly what is meant by ‘context’ in order to establish degrees of dependence/independence of context. Maton does not directly tease out this issue, but elaborates via two case studies. The first investigated a Masters level task where instructional designers of learning resources had to analyse case studies of actual projects, drawing connections to literature in the field and their own design experiences along with identifying ‘major project management issues’ in instructional design. A *study specific* external language of description of varying levels of abstraction in student responses was developed for the analysis. So, here, contextual independence refers to students detaching themselves from the particulars of their own professional experience, and the specificities of provided case studies. That is they were expected to distance themselves from specific social contexts of experience. Greater abstraction from context was also linked with students’ capacity to draw out generalised insights about, and principles for, instructional design. The study showed how few students were able to do this, and posits the absence of scaffolded models of the required weakened semantic gravity to guide students as one reason for the paucity of decontextualisation in student responses to the task.

The second case study looks at a thematic unit of study in school English, for the New South Wales Higher School Certificate. Students had to study a variety of texts under the theme *The Journey*, and write an integrative answer exploring how much studying the “concept of imaginative journeys expanded your understanding of yourself, of individuals and of the world” (2014, p.117). Maton characterises this task as aiming to weaken semantic gravity by pointing students to engagement with broader literary principles applicable to multiple texts. Analysis of a high and low achieving essay revealed very different profiles. The high essay moved from relatively weak semantic gravity (generalising with a literary gaze) down to particularities of individual texts, then upwards again to more abstract concepts. This builds a semantic gravity wave through the essay, propelled by a cultivated knower code (2014, p.119). The student presents her insights filtered and altered through a literary gaze. By contrast the low essay shows a ‘flat’ profile of much stronger semantic gravity and narrower range. The essay is segmentally structured with strongly bounded discussion of each text. Stronger semantic gravity is expressed through localised discussion of each text along with a personalised

gaze where the writer directly links her subjective experiences to discrete items in the texts. ‘Context’ here is thus construed both as the life and personal experience of the writer and the particulars of individual written texts encountered. Meaning independent of context is implied to be that which is applicable both to those ‘originating’ contexts, and other linked, but putative contexts; thus generalised meaning projected into an idealised literary domain. This involves linguistic realisations of such abstractions in a depersonalised written register. The nature of the links between forms of detachment from social and symbolic contexts, and forms of linguistic realisation of these, remains a key area to be researched. Fruitful ongoing collaboration between Systemic Functional Linguistic scholars and LCT scholars are opening up this area productively (see, for example Maton & Doran, forthcoming; Maton, Martin and Matruglio, in press, 2014; Martin, 2011, Martin, 2014).

The concept of semantic gravity invites consideration against Cummins’ earlier concepts of Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALPS) (1991), and his later extension of these into his matrix with two intersecting continua – the first being Contextually Embedded/Decontextualised Language, and the second being Cognitively Demanding/Cognitively Undemanding Tasks (2009, 2013). These were developed for the specific purpose of understanding the situation and educational needs of immigrant children having to learn through the medium of a new language while developing bilingual proficiency. Cummins proposed that such learners mastered everyday language (BICS) up to three years sooner than they mastered CALPS in their new language. In LCT terms BICS could be related to knower structures, while CALPS could be linked to knowledge structures. However, they are not knower/knowledge discourses in themselves, but communicative resources deployed to effect communication within knower and knowledge structures. Cummins’ matrix enables finer, non-dichotomised distinctions than possible just with the BICS/CALPS division. For example, two teenagers conversing casually via smses are engaged in relatively context-reduced (in terms of the channel of communication), but probably cognitively undemanding communication. Two academics fiercely debating the merits of code theory versus field theory over a beer in a pub are engaging in relatively communicatively context embedded, but cognitively demanding communication. ‘Context’ here comprises mostly the extra-linguistic dimensions of communication. So context-embedded language is that where meaning is carried para- and non-linguistically, as well as linguistically, and interlocutors have recourse to immediate negotiation and

re-negotiation of the meanings being constructed. Context-reduced language is that where the language itself carries most of the communicative meaning, so requiring high levels of linguistic explicitness. 'Cognitive demand', for Cummins, refers to the extent to which the linguistic tools required for a task have been deeply internalised and automatised. Cummins is thus not explicitly teasing out variations of conceptual abstraction and demand. However, working with such an understanding of a 'cognitive demand' continuum could provide a helpful matrix for educators and materials designers.

Cummins' model was strongly critiqued, amongst other reasons, for its inadequate linguistic conceptualisation of CALPS. In responding to the criticisms, he cited the work of Biber (1986), and Gibbons and Lascar (1998) as providing sound linguistic evidence for the existence of academic registers involving varieties of 'distanced' language. Gibbons and Lascar, drawing upon SFLs Mode parameter, concluded: "Register is a product of the relationship between the linguistic systems and the contexts of their use." (1998, p.41). This debate points back to the long vexed question of how to understand the inter-relationship between conceptual structures, cognitive processes, their realisations within linguistic structures, and their relationships to situational and social factors.

While there is overlap between the concepts of semantic gravity and CALPS they cannot be conflated, in part because they exist to do different things. Semantic gravity, as part of LCT, sets out to theorise social practices of people, beyond the needs of bilingual learners and education, and, in principle, beyond education itself. It focuses upon conceptual decontextualisation, that is, processes of knowledge abstraction. Cummins focuses primarily upon issues of communicative contextualisation/decontextualisation. However, consideration of the prior debates around the intricacies of unravelling the linguistic/cognitive/pedagogic interface of register variation illuminates the work still to be done in establishing the precise nature of semantic gravity continua in diverse educational fields and processes of knowledge building, and their linguistic realisations. As part of an ongoing dialogue between LCT and Systemic Functional Linguistics (SFL) scholars, Martin and Matruglio (2013) are re-exploring the SFL concept of Mode in the light of Maton's proposals regarding semantic gravity and highlighting the linguistic complexity that must be recognised and worked with. What LCT's semantic plane offers educational researchers is an analytical toolkit providing a pedagogically focussed way into the intricacies

of educational practices. The resultant insights may then highlight linguistic aspects of these situations that need additional close research attention, enabling strategic, targeted application of the most salient aspects of dense linguistic theory for pedagogically focused problems.

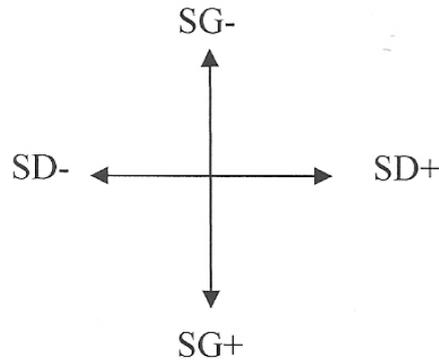
In close juxtaposition with semantic gravity, Maton proposes the notion of semantic density which

refers to the degree of condensation of meaning within socio-cultural practices (symbols, terms, concepts, phrases, expressions, gestures, actions, clothing, etc.). . . The stronger the semantic density (SD+), the more meanings are condensed within practices; the weaker the semantic density (SD-) the less meanings are condensed. The strength of semantic density of a practice or symbol relates to the *semantic structure* in which it is located' (p.129).

For example, the word 'world' can be more or less semantically dense depending on its semantic location. It is relatively less semantically dense in the question 'Where in the world is Waldo?' in the *Where's Waldo?* children's books where the reader has to hunt for Waldo in complex, crammed double-page pictures. It is relatively more semantically dense in the opening line of Wordsworth's sonnet *The World Is Too Much With Us*: "The world is too much with us; late and soon. . . ." While the former instance indexes geographical (and pictorial location), the latter invokes an associative network of worldliness, materialism and consumerism as societal burdens. 'World' in geography could condense many more meanings, and invoke a complex network of conceptual relations, including the whole earth and its:

- peoples,
- surface features (geomorphology) – mountains, ravines, oceans, lakes, volcanoes, caves; (ecosystems) – savannah, alpine, riverine, tropical;
- atmospheric features – gases.

Again, LCT focuses on possibilities of nuanced tracking of shifts in semantic gravity and semantic density, through pedagogic processes and artifacts, as well as in intellectual theories. Each principle is presented as a continuum, which, when juxtaposed in intersection with each other, generates a semantic plane, enabling a basis for both 'typologising practices' and 'topologically exploring differences *within* types and dynamic processes of strengthening and weakening (SG $\uparrow\downarrow$, SD $\uparrow\downarrow$) as presented in Figure 5.

Figure 5: Semantic Plane

Combining semantic density and semantic gravity as analytic tools permits the tracking of shifts in the nature and coherence of pedagogic discourse over time, using notions of semantic waves, and degrees of semantic flow (Matruglio, Maton and Martin, 2013).

Key issues for ongoing research include establishing to what extent, and in what ways, semantic waves promote cumulative learning in different disciplines. Building cumulative knowledge of where, and what forms of, semantic waving are highly valued across, and within, disciplines is important. Establishing profiles of teachers/learners in terms of semantic waving and how these relate to learner achievements could also be productive. However, these developments are just alluded to within this book. Maton points to LCT being deployed in praxis (Martin and Maton, 2013) and, he says, this is “stimulating new ways of realising LCT through what can be termed *external languages of enactment*” (2014, p.209) such as a project in secondary schools explicating the notion and pedagogic salience of semantic waves to teachers. Clarence recently investigated the presence, absence and nature of semantic waving and its role in cumulative learning in humanities tertiary education (2014).

Numerous other aspects of the book, merit close attention, most notably Maton’s exposition of cosmologies, that is “how belief systems... underlie the ways actors select and arrange *clusters* and *constellations* of stances that, in turn, shape what is viewed as possible and legitimate within a field” (2014, p.149), along with his concepts of axiological and epistemological condensation. Another key area is his refinement of the ideas of epistemic

relations and social relations to account for ‘minor differences’ within each category that he argues have ‘major effects’ (2014). These are well worth engaging with and offer fertile insights and tools that could be productively deployed to explore issues, such as shifts within specific disciplines and how certain concepts, theories and pedagogical approaches gain ascendancy and others do not.

Knowledge and Knowers is lucid, generous and written with elegance and conviction. While LCT focuses broadly on social practices, and on the nature and effects of knowledge in particular, the dominant focus of *Knowledge and Knowers* is on knower structures. Maton deftly fuses insights from Bourdieu and Bernstein in setting out a cogent theory of knowledge and knowers. A key contribution is the richness and flexibility of the toolset, with demonstrated analytic power in researching educational practices across an array of levels and contexts. While Maton’s contribution is substantial and insightful in his capacity to draw together salient aspects of diverse theoretical traditions, and to tilt at the windmills of inadequate educational research, he is also quick to acknowledge and point to the collective contributions of many other scholars to the growth of LCT. *Knowledge and Knowers* is provocative, thought-inducing and generative; offering a powerful, multi-faceted array of analytical tools to the project of cumulative knowledge building in the field of educational research.

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Fiona Jackson
School of Arts
University of KwaZulu-Natal

fjackson@ukzn.ac.za