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Disciplinarity

Functional Linguistic and Sociological Perspectives

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Chapter 4

Theories and Things: The Semantics of Disciplinarity

Karl Maton

And our progress can best be gauged by comparing our old problems with our new ones. If the progress that has been made is great, then the new problems will be of a character undreamt-of before. There will be deeper problems, and there will be more of them.

Karl Popper (1994: 4)

Introduction

In proclamations of a brave new world of enquiry where disciplinary forms of knowledge are consigned to the dustbin of history, a dimension of disciplinarity is typically denied: the capacity to *build* knowledge. Most pronouncements of the death of disciplines (whether notices of their demise or calls to hasten their end) do not suggest the potential to build knowledge over time will be lost, for that potential is held to have been illusory. From this perspective, to believe in such notions of advance and progress is to suffer from what Bourdieu (1996) termed 'misrecognition' and be in thrall to misguided beliefs in grand narratives or scientism. Similarly, to argue that induction into disciplinary knowledge might enable students to develop disciplined thought is to wish a return to a dominating, teacher-centred approach where passive students are injected with inorganic and alienating knowledge. In both cases, 'disciplinarity' is not associated with creating cumulative and integrative knowledge but rather with stultifying, sclerotic obstacles to intellectual enquiry. Such arguments are exerting considerable influence in educational research. For example, practitioners of approaches that lay claim to the appellation 'critical' (such as post-structuralist theories) often eschew aspirations to building knowledge (while citing past work they are drawing on) and to notions of progress (while describing previous ideas as inadequate). Such positions fail to take account of the simple but inconvenient truths that disciplines and approaches can actually build knowledge over time and that some do it better than others. This raises the question of what enables them to do so, an issue this chapter aims to explore.[1]

This question was also raised by the later work of Basil Bernstein, particularly his analysis of 'knowledge structures' (2000: 155–174). Bernstein distinguished between 'hierarchical' and 'horizontal' knowledge structures, highlighting different forms taken by the symbolic dimension of intellectual fields and their modes of development over time. Hierarchical knowledge structures, exemplified by the natural sciences, are explicit, coherent, systematically principled and hierarchical organizations of knowledge that develop through the integration and subsumption of existing knowledge. Horizontal knowledge structures, exemplified by the humanities and social sciences, are a series of strongly bounded approaches that develop by adding another approach alongside existing approaches. Bernstein highlights two key differences between these knowledge structures, which Muller (2007) terms 'verticality' and 'grammaticality'. First, verticality refers to the relations between ideas *within* hierarchical knowledge structures, which Bernstein describes as 'attempts to create very general propositions and theories, which integrate knowledge at lower levels and in this way shows underlying uniformities across an expanding range of apparently different phenomena' (2000: 161). As such, they 'appear by their users, to be motivated towards greater and greater integrating propositions, operating at more and more abstract levels' (2000: 161). Where hierarchical knowledge structures are more integrated ('verticality'), horizontal knowledge structures are segmented. Secondly, grammaticality refers to relations between ideas and empirical data and describes the way some knowledge structures generate relatively unambiguous empirical referents ('stronger grammar', such as physics), while others are less capable of doing so ('weaker grammar', e.g. sociology). These two features are said to be central to the capacity of knowledge structures to build knowledge; as Muller summarizes:

> verticality determines the capacity of a theory or language to progress integratively through explanatory sophistication . . . grammaticality determines the capacity of a theory or a language to progress through worldly corroboration. (2007: 71)

These two dimensions recur in Bernstein's model of individual theories in terms of internal (L1) and external (L2) 'languages of description' (2000: 131–141). L1 'refers to the syntax whereby a conceptual language is created', or how the constituent concepts of a theory are interrelated; and L2 'refers to the syntax whereby the internal language can describe something other than itself' (2000: 132), or how a theory's concepts are related to empirical data. Bernstein describes the 'syntax' or principles of each language as being stronger or weaker. A stronger L1 is where concepts are tightly interrelated within a theory; a stronger L2 is where concepts and empirical data are related in relatively unambiguous ways.

With these two sets of concepts, Bernstein helped bring knowledge and its modes of change over time into view in ways that are generating productive debate and research within social realist sociology of education (Maton and

Moore 2010). They also represented a key sociological starting point for what Martin (this volume) terms Phase III of the ongoing, fruitful interdisciplinary dialogue between social realism and systemic functional linguistics (e.g. Christie and Martin 2007). However, while suggestive, these concepts require development for several reasons.

First, the notion of 'verticality' gives the impression of generating a deficit model. As Muller (2007: 71–72) suggests, Bernstein's account views verticality as a categorical principle of presence/absence: a field either has verticality or it does not. By characterizing only hierarchical knowledge structures as doing so, the model implicitly suggests the social sciences and humanities have not created ideas which 'integrate knowledge at lower levels' and show 'underlying uniformities across an expanding range of apparently different phenomena'. Ironically, this does not explain the possibility of the development of Bernstein's own theoretical framework (which I discuss, below). More generally, as social realist thinkers argue (Maton 2010a; Moore 2010), horizontal knowledge structures *are* capable of integrative and subsumptive development, at least within each of their segmented approaches. Developing Bernstein's dichotomous model to avoid discounting this capacity is relatively simple: one can recast his ideas to describe a continuum of *stronger* and *weaker* verticality. This does not, though, resolve a second issue, which is that the framework remains divided between concepts for intellectual fields (verticality/grammaticality) and for individual theories (L1/L2). Redescribing verticality along a continuum of strengths from stronger to weaker (in the same way as Bernstein defines L1 as stronger/weaker) helps align the two sets of concepts. However, this does not address how they can be integrated within a more encompassing framework. The key is to advance the model beyond ideal types by analysing the underlying principles structuring different kinds of theories and knowledge structures.

Lastly, and most importantly, it is not clear what the two couplets refer to, beyond highlighting internal relations of knowledge (verticality/L1) and external relations of knowledge to data (grammaticality/L2). For example, we are told that verticality determines the form of intellectual progress but not what it is or how it determines that progress. The problem is that verticality is known by its outcomes and we cannot replace it by X, that is by a description of its internal structure as one of a range of possibilities (e.g. W, X, Y, Z). Similarly, the principles underlying L1 and L2 are not made clear and so what makes a language of description stronger or weaker remains uncertain. As Muller argues, the concepts remain 'locked into an early (lexical) metaphorical stage of discussion, where the terms are more suggestive than they are explanatory' (2007: 65). To paraphrase Bernstein, this does not mean we should abandon these ideas but we need to recognize them for what they are, something good to think about – they 'may alert us to new possibilities, new assemblies, new ways of seeing relationships' (1996: 137).

In short, the underlying principles of verticality/L1 and of grammaticality/L2 are unexplored in Bernstein's model. It is not clear what these two

dimensions refer to, how they are related in different knowledge structures and how they work together to shape the building of knowledge over time. In this chapter I address each of these issues in turn by analysing: what the internal relations (verticality/L1) comprise; what the external relations (grammaticality/L2) comprise; and how they relate together to enable or constrain cumulative knowledge-building. I do so in a manner that itself aims to cumulatively build on Bernstein's framework with concepts that extend his insights and are applicable to both individual theories and whole intellectual fields. I first outline these concepts before then addressing in turn the three issues through an analysis of two theories with similar foci, influences and concepts but differing capacities for cumulative knowledge-building.

Legitimation Code Theory: Semantics

The concepts I draw on to develop Bernstein's model form part of a wider approach called Legitimation Code Theory (LCT). This framework cumulatively builds on the insights of Bernstein, Bourdieu, critical realism and other theories, and represents part of the 'coalition of minds' known as social realism (Maton and Moore 2010). LCT has five dimensions. The best known at present is LCT(Specialization) which builds primarily on the concepts of *epistemic relation, social relation, knowledge-knower structures* and four *specialization codes* (Maton 2000, 2007, 2010a; Moore and Maton 2001). This dimension is proving fruitful in a wide range of studies (e.g. Carvalho et al. 2009; Lamont and Maton 2008, 2010; Luckett 2009; Chen et al., this volume). It is also part of the sociological contribution to Phase III of the interdisciplinary dialogue between social realism and systemic functional linguistics, with a growing number of studies using both frameworks (e.g. Doherty 2008; Luckett 2009; Martin 2009; Hood 2010; Christie and Macken-Horarik, this volume; Hood, this volume). This dimension provides one way of analysing the underlying principles structuring intellectual and educational fields and I shall draw briefly on these ideas to define different forms taken by a theory's external relations. My principal focus, though, is a newer dimension, which Martin (this volume) describes as central to the move towards Phase IV of dialogue: LCT(Semantics). This dimension arose from engagement with ideas from systemics, especially notions of grammatical metaphor and technicality (Martin, this volume), and primarily builds on the concepts of *semantic gravity, semantic density, constellations* and *cosmologies* (Maton 2009, 2010a, forthcoming). Here I focus on the first two concepts.

Semantic gravity (SG) refers to the degree to which meaning relates to its context. Semantic gravity may be relatively stronger (+) or weaker (–). Where semantic gravity is stronger (SG+), meaning is more closely related to its context; where weaker (SG–), meaning is less dependent on its context. The context may be social or symbolic.

Semantic density (SD) refers to the degree to which meaning is condensed within symbols (terms, concepts, phrases, expressions, gestures, etc). Semantic density may be relatively stronger (+) or weaker (–). Where semantic density is stronger (SD+), symbols have more meaning condensed within them; where semantic density is weaker (SD–), symbols condense less meaning. The meanings condensed within a symbol may be an empirical description (or other meanings with relatively direct empirical referents) or they may be feelings, political sensibilities, taste, values, morals, affiliations and so forth.

Semantic gravity and semantic density may be independently stronger or weaker along two continua of strengths (SG+/–, SD+/–). Varying their relative strengths generates four principal *semantic codes of legitimation* (or, for brevity, *semantic codes*), as represented by the quadrants of Figure 4.1.[2] One can also describe *processes* of:

- *weakening* semantic gravity, such as when principles are abstracted from the concrete particulars of a specific context or case, or strengthening semantic gravity, such as when abstract ideas are made more concrete; and
- *strengthening* semantic density, such as when a lengthy description is condensed into a term, or weakening semantic density, such as when an abstract idea is fleshed out with empirical detail.

This is significant because, I shall argue, it is movements up and down the semantic continua, not just specific states of 'stronger' or 'weaker', that are crucial to the knowledge-building attributes of disciplinarity.

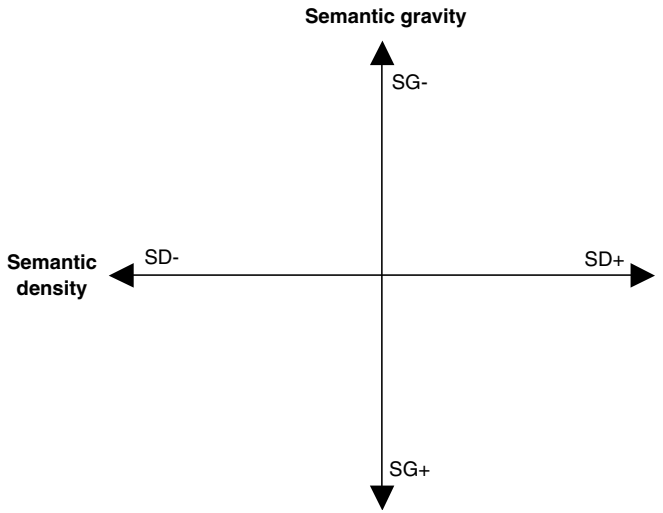

Figure 4.1 Semantic codes of legitimation

Note: SG- is heuristically positioned at the top of the compass (where a '+' sign might be expected) to reflect the tendency to picture such notions as 'abstract' or 'decontextualized' as higher than 'concrete' or 'contextualized'. Positioning here is not a statement of value.

To explore the basis of knowledge-building, I shall use these concepts to analyse two modes of theorizing with different capacities for enabling cumulative knowledge-building. To illustrate these modes I focus on the work of Basil Bernstein and Pierre Bourdieu. I choose these two for several reasons: focusing on two theories within one knowledge structure enables the analysis to be succinct enough for a chapter; they are arguably the two most influential post-war sociologists of education; and they are ostensibly similar. Both theorists are Durkheimian (among other influences), both aspire to building relational theories, they offer similar concepts (e.g. 'habitus' and 'coding orientation' are conceptualizations of similar phenomena), and both are theories that LCT is itself built upon. The analysis comprises three parts reflecting the earlier questions: internal relations (the ways the theories relate concepts to other concepts); external relations (such as to data); and how these two work together to enable or constrain cumulative knowledge-building. I show that in Bernstein's mode these two dimensions are characterized by particular strengths of semantic gravity and semantic density that potentially enable both verticality and grammaticality. In contrast, Bourdieu's mode of theorizing is characterized by an internal language with weaker vertical relations of condensation and abstraction between concepts, and external relations based on a 'cultivated gaze' rather than an external language of description. This I argue limits its capacity for enabling cumulative knowledge. I conclude by arguing that semantic codes provide a way of understanding this dimension of disciplinarity, the capacity to build knowledge over time, that advances beyond Bernstein's model, and in ways that themselves raise new questions.

I should emphasize: I am concerned with *the mode of theorizing* each theory represents and their *potential* for enabling cumulative knowledge, not with their theories and achievements *per se*. I am asking what *kind* of theorizing offers the greatest resource potential for knowledge-building, not which theory is better. As I mentioned, LCT builds upon both, and I explore elsewhere what Bourdieu's mode offers that Bernstein's mode does not (Maton, forthcoming).

Internal Semantic Relations: Reconceptualizing Verticality

Bernstein's Internal Language

In his theorizing, Bernstein successively weakens semantic gravity and strengthens semantic density (heightening abstraction and condensation of meaning) both in the development of particular concepts and through the evolution of the overall framework. For example, Bernstein's analysis of progressivist pedagogy (1977, chapter 6) begins with a description of six fundamental characteristics of a progressivist classroom, such as control of the teacher over children being implicit (see Figure 4.2). These are then analysed in terms of three basic features said to regulate pedagogic relations: 'hierarchy', 'sequencing rules' and 'criteria'. The preceding characteristics are described as one possible

Theorization	Semantic gravity	Semantic density
pedagogic device (see Figure 4.3)	–	+
pedagogic codes: $\frac{E}{\pm C^{le} / \pm F^{le}}$		
classification and framing (±C, ±F)		
visible and invisible pedagogies		
hierarchy, sequencing rules, criteria	+	–
description of empirical features		

Figure 4.2 An example of semantic shifts through Bernstein's theory

form of these features, such as implicit rather than explicit. These are in turn gathered and condensed into a distinction between 'visible pedagogy' (where all three are explicit) and 'invisible pedagogy' (all are implicit). Further analyses abstract and condense the principles underlying these pedagogies in terms of strengths of 'classification' and 'framing', where the original description is one (-C, -F) of four possible modalities (±C, ±F). At this point three characteristics of the theorizing become increasingly salient. First, these concepts are less contextualized, for they are not necessarily locked onto descriptions of pedagogy: 'classification' refers to the strength of boundaries between contexts or categories, and 'framing' refers to the locus of control within those contexts or categories (1977: 176). Secondly, this generative conceptualization is of greater generality, because the other possible modalities may never have been actualized or empirically observed. Thirdly, as the framework moves towards higher levels of abstraction, it subsumes and integrates meanings at lower levels. The concepts of classification and framing incorporate preceding conceptualizations (Figure 4.2). They are in turn subsumed within a more generalizing conceptualization of 'pedagogic codes', which Bernstein defines as:

$$\frac{E}{\pm C^{le} / \pm F^{le}}$$

> where *E* refers to the orientation of the discourse (elaborated): _____ refers to the embedding of this orientation in classification and framing values. (Bernstein 2000: 100)

These processes of decontextualizing, generalizing and subsuming are repeated in a further stage of theorizing when Bernstein shifts the focus from conceptualizing the structuring principles underlying empirical phenomena to conceptualizing what generates those principles in terms of the 'pedagogic device' (1990: chapter 5). At this stage the theory reaches a relatively high degree of abstraction and generality, which Bernstein condenses in the form of a complex diagram (Figure 4.3) that reaches from the family to the 'international field' context.

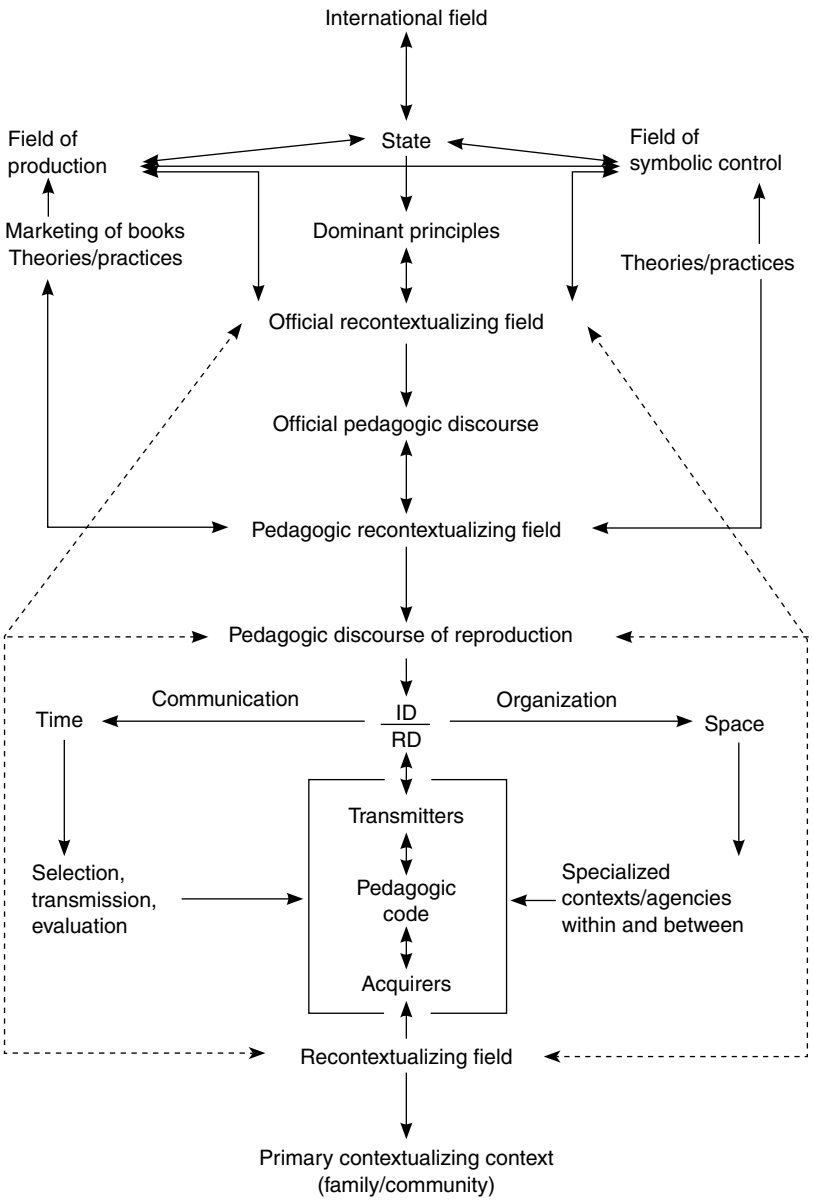

Figure 4.3 The pedagogic device

Source: Bernstein (1990: 197).

Bernstein himself would describe his theory as 'vertical discourse': meanings are related to other meanings rather than to social contexts ('horizontal discourse'). However, just as important is the *form* this relating takes. From this brief description of a part of his framework, it can be seen that higher-order concepts are abstractions from abstractions and condensations of condensations: SG–, SD+. When these relations to lower-order concepts are explicitly defined, it creates tight, vertical *abstraction-condensation chains*. For example, as the quote above shows, 'pedagogic codes' includes 'elaborated', 'classification' and 'framing'. Often new concepts are not explicitly of a higher order but rather new versions of past ideas aiming at greater generality or at condensing a greater range of meanings. For example, 'pedagogic codes' also subsumes such previous conceptualizations as 'positional'/'personal' and 'instrumental'/'expressive' (Bernstein 2000: 89–100); or: 'Elaborated and restricted codes have not disappeared, nor have they been abandoned: they have been subsumed under higher order concepts' (2000: 207). However, relations between different aspects of Bernstein's theory are not always systematically explicated – relations between earlier and later versions of concepts or between different concepts (such as 'educational knowledge codes' and 'knowledge structures') often remain tacit. Thus, Bernstein's concepts are not always as interlocking vertically as they could be, nor as strongly related horizontally as those of Bourdieu (see below). This partly results from the dynamic nature of this mode of theorizing – each set of conceptualized principles raises the question of what in turn underlies them, and more generalizing ideas replace existing notions (vertical extension). It also partly results from a lack of explication. However, this mode of theorizing retains the *potential* for such relations to be made explicit.

Bourdieu's Internal Language

Bourdieu's concepts are also characterized by high levels of abstraction and condensation. 'Habitus', for example, encompasses a wide range of meanings that are context-independent, including 'the *result of an organizing action . . . a way of being, a habitual state* (especially of the body) and, in particular, a *predisposition, tendency, propensity or inclination*' (1977: 214, original emphases). However, it is the *relations between concepts* that are of significance in determining the nature of an internal language rather than the concepts themselves. In these terms, Bourdieu's theory is characterized by different levels of abstraction and condensation. Many of his concepts are tightly interrelated. For example, the constituent concepts of 'practice' ('field', 'capital' and 'habitus') and those of 'symbolic violence' (including 'pedagogic work', 'pedagogic authority' and 'cultural arbitrary') are defined in terms of each other (Bourdieu 1977; Bourdieu and Passeron 1977). There are also

vertical relations between concepts. The logic of practice, for example, is summarized as:

> [(habitus)(capital)] + field = practice.
> (Bourdieu 1984: 101)

This condenses the idea that practice results from relations between one's structured and structuring dispositions (habitus) and one's relational position in a field of struggles (capital), within the current state of play of struggles in that social arena (field).

However, where this mode of theorizing differs from that illustrated by Bernstein's theory is the nature of these relations: they are between concepts of equivalent magnitudes of semantic gravity and semantic density. The concepts are thus more strongly related horizontally than vertically. Vertical relations do not move as far along the semantic continua of gravity and density by abstracting and condensing the *principles* underlying habitus or capital or field (and thus practice). In this mode, higher-order concepts are thus created by establishing *horizontal* relations between lower-order concepts. Similarly, at a lower level, 'habitus' is defined as a 'structured and structuring structure' (1994: 170) but the principles underlying that 'structure' are not abstracted.

Internal semantic relations are thus characterized by relatively stronger gravity and weaker density. This limits a potential stimulus to theoretical development: answers (e.g. 'habitus') do not fruitfully lead to new questions of underlying principles ('what are the underlying principles of habituses?'). This in turn reduces the number of levels or orders of concepts and so vertical extension of the theory. For example, Bourdieu defines the structure of a 'field' as given by the rate of exchange between its species of 'capital' (status and resources), where their relative values reflect the state of play in struggles among actors possessing those capitals. This raises the question of how their relative status is determined at a particular moment in time, or what the exchange rate mechanism is that actors are struggling over. Bourdieu's response reflects a horizontal mode of theorizing: the limits of the field and of legitimate participation are at once what are at stake in struggles, the ground over which struggles are fought, and what are used in struggles (1994: 143). The field is not only the thing, it is the *only* thing – there is no underlying generative mechanism and so no higher-order concept to be defined. There is thus less vertical extension within the theory.

Summary

The mode of theorizing represented by Bernstein's framework develops through the integration and subsumption of concepts at lower levels within

higher-order concepts. This relation is one of greater generality and abstraction, and higher condensation. Its internal relations are thus characterized by semantic moves to weaken gravity and strengthen density, or L1 = SG–, SD+. In contrast, the mode of theorizing represented by Bourdieu's framework develops through the creation of new, similar order concepts or through bringing these concepts into horizontal relations. Its internal constituents are strongly interlinked horizontally but do not extend as far vertically. Though the concepts themselves are characterized by low context-dependency and high condensation, and so share similar features to those of Bernstein, the *mode of theorizing* and its development do not. Once an initial abstraction and condensation has created concepts, Bourdieu's theory remains at the same level and advances horizontally; the semantic code of its L1 is thus SG+, SD–.

External Semantic Relations: Reconceptualizing Grammaticality

Bernstein's External Language

The key external relation of the mode of theorizing exemplified by Bernstein's work is to the empirical world. Bernstein insisted that the development of theory is of little consequence if the results are unable to engage with empirical problems (2000: 131–141). This is not the imposition of a model onto empirical phenomena; rather, the theory 'must submit to an external *ontological* imperative' (Moore 2001: 13), it 'does not simply picture or represent reality; it *engages* directly with it, enters into a relationship with it' (Moore and Muller 2002: 627). For Bernstein, concepts and data must be able to speak to one another, a dialogic relation between theories and things. This has two implications. First, in LCT(Specialization) terms, it exhibits a stronger epistemic relation (ER+) between knowledge and its object. Secondly, to enable dialogue between theory and data requires an explicit means of translating meanings along this epistemic relation. This is what Bernstein refers to as an external language of description or L2: a means for translating theoretical concepts into empirical descriptions and empirical descriptions into theoretical concepts. Once such an explicit means of translation is established for the specific object being studied, then the basis for analysis is visible for other researchers to engage with – it does not matter who you are as a person, you can see (once you understand the theory) if it makes sense, is consistent with the data, etc. So these relations are also characterized by a weaker social relation (SR–) between knowledge and its subjects (actors). The external relations of Bernstein's theory are thus characterized by ER+, SR– or a *knowledge code* (Maton 2000).

For Bernstein, this external language is crucial: 'a theory is only as good as the principles of description to which it gives rise' (2000: 91). An obvious

objection is that these are more discussed than explicitly illustrated in Bernstein's own corpus, something he acknowledged: 'In my case sections of the theory (usually without strong principles of description) always preceded the research' (2000: 121). However, one should not elide the form of publication nor the theoretical framework with the *mode* of theorizing: that Bernstein did not prolifically publish external languages does not mean this mode cannot generate them. Indeed, there are a number of examples by other scholars.[3] One example is included in Table 4.1: an external language of description for the concept of 'semantic gravity'. This was chosen not simply to be reflexive (by discussing the semantic gravity of an L2 for the concept of 'semantic gravity') but because it illustrates how an external language is not merely the 'operationalization' of concepts.

This language of description draws on a study by Bennett (2002) of a constructivist learning environment, specifically a postgraduate Masters degree course for training instructional designers (professionals who design learning resources). It utilizes one aspect of this research that explored a task using 'case-based learning' and designed according to principles of 'authentic learning'. The unit of study required students to analyse two case studies of real-life instructional design projects. The column entitled 'Coding of responses' builds on the analytic grid Bennett developed to analyse students' work products, one adapted from Allen's (1995) use of frameworks for classifying reflective writing, originally developed by Hatton and Smith (1995) and Sparks-Langer et al. (1990). To develop the language of description, the original coding scheme was reinterpreted and re-sequenced in terms of representing different strengths of semantic gravity. The results of the re-analysis were presented in Maton (2009) in a paper on 'cumulative and segmented learning' that illustrated the value of the concept. The concept of 'semantic gravity' itself had also been developed separately (Maton 2010a) and its definition was further advanced through the process of developing this language of description. It thereby brings together empirical research that unfolded prior to and separate from a theoretical development that was unfolding in relation to other empirical projects, and results from successive movements between the theory and the data until a means of translation emerged. The form of relations between the theoretical and the empirical involved in generating a language of description is thus neither empirically inductive nor the imposition of a pre-established matrix onto data. Rather it arises from as well as enables a movement between theory and data – it is 'the dialogic move between the two that Bernstein emphasises' (Moss 2001: 18).

If one now analyses the semantic codes of this illustrative external language, relations between concepts and data are characterized by stronger gravity than an internal language. They are 'locked onto' a particular empirical phenomenon, in this case student work products. External languages for using the same concept to investigate other objects, such as classroom interaction, take different forms, because semantic gravity is realized differently in other

Table 4.1 An external language of description for 'semantic gravity'

Semantic gravity	Coding of responses	Form taken by student responses	Example quote from student answers
Weaker ↑	Abstraction	Presents a general principle or procedure that moves beyond the cases to address wider or future practice.	Legal and intellectual property issues are a major consideration when developing a product.
	Generalization	Presents a general observation or draws a generalizing conclusion about issues and events in the case.	Precious time would be wasted and deadlines not met when members did not have a full concept of the project.
	Judgement	Goes beyond re-presenting or interpreting information to offer a value judgement or claim.	While each metaphor provides a realistic learning environment . . . , I felt that the *Nardoo* metaphor assists with navigation, while the *StageStruck* metaphor was a barrier to effective navigation.
	Interpretation	Seeks to explain a statement by interpreting information from the case or adding new information. May include use of other literature or personal experience.	While not alluded to in the interviews, this may have caused problems for the team, as there would have been a new software to work with, and transferral of information from *Hypercard* to *MediaPlant*.
	Summarizing description	Descriptive response that summarizes or synthesizes information presented in the case, including re-wording and re-structuring of a number of events into one statement. Does not present new information from beyond the case.	This involved creating the overall structure and content of the project, with design briefs and statements being forwarded to the client, with the final design statement being signed off by the client, giving a stable starting position for the project.
↓ **strong**	Reproductive description	Reproduces information directly from the case with no elaboration (i.e. quotations).	The NSW Department of Land and Water Conservation approached the Interactive Multimedia Learning Laboratory at the University of Wollongong to develop an educational multimedia package.

Source: Maton (2009: 49), developed from Bennett (2002).

contexts and practices. It also exhibits relatively weaker semantic density, with (albeit succinct) descriptions of the concepts and their realizations within the data. The semantic code of this L2 (or grammar) is thus SG+, SD–. Just as important is what this does to meanings. Reading Table 4.1 from right to left, the external language works to: *weaken semantic gravity* by moving away from the concrete specificities of student work products; and *strengthen semantic density* by condensing lengthy descriptions. Reading from left to right, the external language also works to successively *strengthen semantic gravity* by moving from: abstract concepts (in this example, differing strengths of SG); to what forms these take in this kind of object of study ('abstraction', 'summarizing description', etc); to how these forms are in turn realized in student work products ('Presents a general principle . . .', etc.); and to examples of how these are realized in the specific object of study (quotes from student answers). At the same time condensed concepts are fleshed out, successively *weakening semantic density* by filling in more empirical detail. So an external language provides a means of moving meaning both up and down the continua of strengths of both SG and SD.

An external language thereby enables the *possibility* of dialogue between concepts and data. New problem-situations can 'speak back', demanding clarifications, revisions or extensions of the theory (as they did in the case of developing the concept of 'semantic gravity'). Of course, this potential is not necessarily realized. For example, some scholars do not recognize this two-way translation of meaning and portray empirical research using Bernstein's framework as imposing or 'testing' the theory. This conception leads to frustration when data does not neatly match the theory's categories and to criticism rather than creation.[4] Moreover, dialogue may not always require development of the internal language of the theory – this depends on the degree of explanatory power it provides the research. As Bernstein put it, the key is 'less an allegiance to an approach, and more a dedication to a problem' (1977: 171). Nonetheless, my concern here is with affordances offered by modes of theorizing rather than achievements of specific theories, and the external semantic code of this mode of theorizing represents a potential for knowledge-building through the particular ways it translates meaning.

Bourdieu's External Gaze

Bourdieu also emphasized that his concepts were intended to engage in a dialogue with data, proclaiming they are 'a *temporary construct which takes shape for and by empirical work*' (in Wacquant 1989: 50, original emphases). Against empiricism he warned of the dangers of accepting the accounts of participants in the object of study. Against theoreticism he warned about confusing the model of reality with the reality of the model (1977: 29) and emphasized differences between 'the *theoretical* aims of theoretical understanding and the

practical and directly concerned aims of practical understanding' (1994: 60). This is similar to Bernstein's position. Where Bourdieu differs is in how he attempts to avoid these problems. For Bourdieu they imply the need for a double 'epistemological break', first from the viewpoints of participants, and secondly from the viewpoint of the detached observer. Crucially, the 'important thing is to be able to objectify one's relation to the object' (1993b: 53) in terms of the effects of one's relational *social* positioning. Relations between theory and data are thus typically understood by Bourdieu in terms of the social positions of actors and their situated viewpoints (Maton 2003, 2005). This way of thinking has two key implications.

First, in this mode of theorizing there are no explicit principles of translation between theory and data (no L2). Instead, Bourdieu attempted to create concepts of sufficient versatility to be flexible enough for any research; as Wacquant argues, 'Bourdieu has not exhibited the "obsessive preoccupation" with achieving relatively unambiguous meaning in his concepts' (in Bourdieu and Wacquant 1992: 35–36). The problem, as Swartz summarizes, is that 'this very appealing conceptual versatility sometimes renders ambiguous just what the concept actually designates empirically' (1997: 109). As has been widely commented, this opens up the possibility of circularity and *ad hoc* explanations, for example: an actor makes bourgeois choices because of their bourgeois habitus; their bourgeois habitus is shown by the bourgeois choices they make (Maton 2003, 2005; Moore 2006). Bourdieu acknowledged this possibility and claimed to be 'keenly aware of this danger' (Bourdieu and Wacquant 1992: 129), but did not explicate how it could be avoided except through vigilance. In short, external relations of the theory are characterized by a relatively weaker epistemic relation (ER–).

Secondly, instead of an external language, Bourdieu's theorizing emphasizes developing a sociological 'gaze' or habitus: 'a system of dispositions necessary to the constitution of the craft of the sociologist in its universality' (1993a: 271):

> The task is to produce, if not a 'new person', then at least a 'new gaze', a sociological eye. And this cannot be done without a genuine conversion, a *metanoia*, a mental revolution, a transformation of one's whole vision of the social world. (Bourdieu and Wacquant 1992: 251)

The emphasis is thus on the gaze of knowers: a stronger social relation between knowledge and subjects (SR+). The external relations of Bourdieu's theory are thus characterized by ER–, SR+ or a *knower code*.

The use here of specialization codes highlights something of significance for understanding forms of theorizing. If one employs Bernstein's model to analyse his own and Bourdieu's theories, one would characterize them as stronger and weaker grammars, respectively – this appears to create a deficit model of Bourdieu's mode. However, that mode *does* possess strong external relations but of a different *kind*. Extending Bernstein's concept of 'grammar',

one can distinguish two kinds: *knowledge-grammars* which relate concepts to data via explicit procedures (L2 in Bernstein's model), and *knower-grammars* which relate concepts or ideas to data via the 'gaze' of knowers (Maton 2010a). All intellectual and educational fields comprise both knowledge *and* knowers, so every field involves a specialized gaze. A key difference is whether possession of specialized procedures generates the gaze (knowledge code) or the gaze defines the legitimate procedures (knower code). For example, training and experience in scientific practices enables a *trained gaze*, but knowledge of and experience in the specialized procedures of science form the gaze rather than the gaze defining the procedures (though it affects in turn when and how those procedures are employed). In contrast, Bourdieu's mode of theorizing relies on a knower-grammar based on a *cultivated gaze*, where experience and immersion in exemplary works shapes the habitus in ways which define the appropriate procedures of enquiry and means of judgement. What matters is learning 'the craft of sociology':

> You have some general principles of method that are in a sense inscribed in the scientific habitus. The sociologist's *métier* is exactly that – a theory of the sociological construction of the object, converted into a habitus. When you possess this *métier*, you master in a practical state everything that is contained in the fundamental concepts: habitus, field and so on. (Bourdieu et al. 1991: 253)

A knower-grammar is less of a stimulus to cumulative knowledge-building because there is no procedurized means for the specificities of different problems to speak back to the theory. Instead this occurs via the actor's habitus. Bourdieu describes the habitus as durable and transposable – it typically takes repeated and lengthy exposure to circumstances for the habitus to significantly change. Thus, to 'master in a practical state everything that is contained in the fundamental concepts' takes time, prolonged practice and typically intimate pedagogic relations to enable a 'genuine conversion, a *metanoia*, a mental revolution', that is to reshape one's dispositions. Once established, these dispositions are again durable and transposable across contexts. Thus a knower-grammar provides a more slowly changing and mediated means of dialogue between data and theory than the external language of a knowledge-grammar. It is unsurprising that though Bourdieu described his concepts as a 'temporary construct', the framework remained relatively unchanged once established. Bourdieu's oeuvre developed primarily through a growing range of applications yielding new and often more nuanced arguments rather than by the creation of new concepts of greater generality. Concepts did change; for example, 'habitus' evolved slowly in this direction in Bourdieu's writings (e.g. from a more cognitive focus to embrace the corporeal; see Maton 2008). However, when a theory is based on a gaze, its development across an intellectual field depends on other practitioners sharing that gaze. In other words, the

theory's external relations are more contextually dependent on the knower and less symbolically condensed: SG+, SD–. Indeed, development of Bourdieu's concepts by other scholars has typically been in the direction of *less* generality and abstraction; for example, a proliferation of adjectives prefixing 'habitus' and 'capital' ('institutional', 'gendered', etc) to denote the arena of social life or kinds of actors being studied. Though Bourdieu can do a Bourdieuian analysis, it is less easy for others to do so in the way Bourdieu argues it should be done, because it depends on the knower.

Conclusion

One dimension of 'disciplinarity' is the capacity to build knowledge over time. As Bernstein's model of knowledge structures highlights, such knowledge-building can be cumulative or segmental to varying degrees. His model suggests two key dimensions affect the form progress takes: verticality and grammaticality (for intellectual fields) or internal (L1) and external (L2) languages of description (for individual theories). These couplets both refer to internal relations among ideas and external relations of ideas to data, respectively. The model offers a heuristic way of thinking about intellectual progress that raises further questions, for it is unclear what the two dimensions comprise, and how they relate to shape knowledge-building. I have proposed two underlying principles as a means of exploring these features: *semantic gravity*, or the context-dependence of meaning; and *semantic density*, or the symbolic condensation of meaning. These were used to briefly analyse the modes of theorizing illustrated by the work of Bernstein and Bourdieu.

The two modes exhibited contrasting strengths of semantic gravity and semantic density which, I argued, enabled or constrained cumulative knowledge-building in different ways. I suggested that stronger L1 / verticality is where a theory relates concepts vertically to lower-order or already established concepts through relations of lower context-dependence (or greater generality and abstraction) and higher condensation. Stronger L2 / grammaticality can be understood as where a theory relates concepts to data through relations of higher context-dependence (lower generality and abstraction) and lower condensation. In other words:

- stronger L1 / verticality is characterized by *weaker semantic gravity* and *stronger semantic density* (SG–, SD+); and
- stronger L2 / grammaticality is characterized by *stronger semantic gravity* and *weaker semantic density* (SG+, SD–).

The semantic code for internal relations provides a basis for both height in the vertical extension of the theory (its capacity to be integrative and generalizing)

and strength of vertical relations within the theory (how well integrated each conceptual strata of the theory is with higher- and lower-order concepts). The semantic code for external relations enables not only the theory to engage with the empirical (so it is not freely floating) but also horizontal extension of the range of substantive problems encompassed by the theory (use of the theory across an expanding range of different, segmented contexts). The capacity for enabling cumulative knowledge-building thereby depends on the semantic codings of L1 and L2 being inversely related, with the strengths given above, or what I'll term the *cumulative modality*.

This modality offers a potential for knowledge-building because of what it *does* to meanings. It lifts meaning out of the gravity well of a specific context through abstracting and condensing principles underlying that context into a compact language, freeing up space in the discourse; and both 'concretizes' the analysis and 'fleshes out' concepts through a dialogue with the particularities of the context. It enables *both* the strengthening and weakening of *both* semantic gravity and semantic density. This it does both between lower-order and higher-order concepts within the theory, and between theory and data. What is key here is the movements of gravity and density rather than specific states: the combination of codes enables maximum movement along the continua. The cumulative modality thus works as a kind of elevator of meaning upwards *and* downwards through both internal and external languages. It thereby enables the recontextualization of knowledge and so the possibility of knowledge-building across different contexts and over time. Bernstein offered the image of a triangle to describe hierarchical knowledge structures; Figure 4.4 extends that to heuristically portray the form taken by this mode of theorizing.

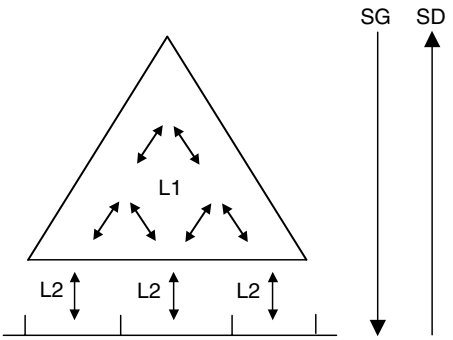

Figure 4.4 The cumulative modality

Note: Triangle represents theory or knowledge structure; segmented line represents objects of study; SG is semantic gravity; SD is semantic density; arrows for SG and SD indicate strengths from weaker to stronger.

The two codes also underpin the dynamic nature of this mode of theorizing. Its internal relations are characterized by each conceptualization of abstract principles raising the question of what in turn generates those principles. Each answer raises new questions; each moment of theorization thereby points forward to a future moment of further theorizing of greater generality, abstraction and condensation. Its external relations, based on a knowledge-grammar, are characterized by each engagement of the theory with a new problem-situation enabling the specificities of that context to pose questions to the theory. There are thus two stimuli to cumulative knowledge-building.

In comparison, the mode of theorizing exemplified by Bourdieu enjoys these stimuli less because of its weaker vertical relations of condensation and abstraction between concepts and emphasis on a 'cultivated gaze' rather than an external language of description. Internally, the questions can soon stop, constraining vertical extension of the theory. Externally, the knower-grammar of the actor's 'gaze' offers a less explicit means for data to 'speak back' to theory. Its combination of strengths of semantic gravity and semantic density for internal and external relations – which can be termed the *segmental modality* – thereby tends towards horizontal development, both in terms of relations between concepts and the applications of these concepts across different topics. This is not to say that knowledge does not build in this modality, especially in the work of an individual author, but rather that it provides relatively weaker enabling conditions for cumulative knowledge-building across an intellectual field. It is also *not* to argue that Bernstein's theory is exemplary or Bourdieu's theory offers little: Bernstein was not always explicit or systematic in relating new to existing concepts, while Bourdieu was prolific in providing exemplary analyses for others to study. My focus has been instead on the *modes of theorizing* their frameworks illustrate and, specifically, the semantic codings of those modes.

The concepts used in this analysis themselves aim to contribute to cumulative knowledge-building. First, semantic codes represent, I am suggesting, part of the 'syntax' of languages of description and knowledge structures that Bernstein pointed to. They also enable the two dimensions of his model (verticality/grammality or L1/L2) to be brought into relation. Secondly, redescribing his model in terms of relative strengths of semantic gravity and semantic density moves the conceptualization from dichotomous ideal types towards underlying structuring principles, the 'X' missing from the existing model. Thirdly, the concepts have greater explanatory reach. I analysed theories but they can also be applied to knowledge structures, as well as student work products (Maton 2009), classroom interactions and all cultural and social practices. This enables different levels to be brought within the same analytical frame. Fourthly, by highlighting different kinds of relations between theories and things – the different forms 'grammar' can take – the analysis brings new issues into view, such as the ways some approaches and disciplines are based on stronger knower-grammars. The illustrative analysis also highlights how a knowledge

structure (sociology of education) can encompass contrasting forms of knowledge-building. Finally, the concepts subsume existing ideas, integrate knowledge at lower levels and show underlying uniformities across an expanding range of apparently different phenomena.

Cumulative knowledge-building, however, also raises new questions. I emphasized that the cumulative modality provides enabling conditions or affordances for knowledge-building but that whether these potentialities bear fruit depends on more than just the form taken by the theory. What else it depends on is the obvious next question. Why a potentially cumulative theory may come to develop or be viewed segmentally requires explanation. Why cumulative theories are less pervasive than segmental theories in fields such as sociology and Education, and how this might be changed, are significant questions if we wish our research to be intellectually serious. Semantics is not the only issue, so other principles underlying progress in knowledge formations remain underexplored. In this illustrative analysis I focused on advances within an approach rather than between different approaches, so how different theories may interact cumulatively is yet another question. Ongoing research into classroom practices using 'semantic codes' alongside systemic functional linguistics is raising questions of the capacity of the theory to explain different phenomena and of its relations with another approach. Of course, issues are not generated from within: each time the concepts engage with a substantive problem, that problem-situation poses questions of the theory. However, as Popper (1994) highlights, the wonderful thing about building knowledge is that each tentative solution to a question in turn raises new questions.

Notes

[1] This is a revised and expanded version of Maton (2010b).

[2] Given that referents for the context (for semantic gravity) and what is condensed (semantic density) depend on the practices being analysed, a comprehensive list of examples of the modalities would be prohibitively long or skewed to one referent. Lest misread and accused of fetishizing knowledge, I should emphasize that these concepts are intended to be applicable to all social practices. As illustrated in this chapter, the realizations of these concepts depends on the specific object of study.

[3] See Morais and Neves (2001), Morais, Neves and Pires (2004) and Hoadley (2007). See also Carvalho (2010), Chen (2010), Doherty (2008) and Lamont and Maton (2008) for examples using LCT.

[4] Such criticisms are typically made of lower-order, ideal typical concepts, such as Bernstein's model of knowledge structures and of identities (e.g. Power 2010). Such research highlights the need to develop both the internal language of the theory by abstracting principles underlying such taxonomies and external languages of sufficient openness. Whether such 'speaking back' is heard this way or not is another matter.

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