

Semantic Waves: Writer Performance Ranges on the National Benchmark Tests (NBT) Academic Literacy Test

Naomi Msusa

Abstract

Some research in student level of preparedness in Higher Education has signalled that student under-preparedness might be compounded by an over-focus on student-centred engagement, learning and teaching methods and the acquisition of academic skills, at the expense of focusing on the *knowledge* itself that is the actual subject of the learning. This paper is an analysis of the test-taker performance on a National Benchmark Test (NBT) Academic Literacy (AL) assessment, used by South African higher education institutions for admission and/or placement. Using Legitimation Code Theory (LCT) and illustrated by semantic waves in particular, the analysis focuses on the structure of the knowledge that underpins the NBT AL test, its indicators for success and their relation to the test-takers. The approach highlights the affordances of LCT as a tool to tease out specific areas of the test that reveal student academic under-preparedness, and how this tool can be used to obtain complementary information from test-taker performance that could be crucial for a foundation programme provider.

Keywords: Legitimation Code Theory, NBT Academic Literacy Test, semantic waves, under-preparedness, foundation provision

Introduction

A considerable amount of research has been done across the South African Higher Education landscape to explore student under-preparedness, its possible causes as well as the subsequent measures that can be put into place

to mediate the status quo and improve student success rates. More current research is focused on gaining a deeper understanding of the actual student cohorts that higher education institutions select and enrol, to allow for an intervention strategy that is systemic in nature, based on a thorough knowledge of the student population that is being served, and one that is relevant to their needs and goals (Tinto 2012). One tool the South African Higher Education sector has used to access this deeper understanding of applicant cohorts is through diagnostic testing – over and above prescribed basic education exit assessments – aimed at obtaining information that is crucial in predicting success and progress of potential students.

The National Benchmark Tests are one such tool, aiming at assessing academic proficiency, that is, the student's ability to read, write and think in the language of instruction, and at the level required of students in Higher Education. In addition to the tests acting as a requirement for admission purposes, the tests may also be taken by students already admitted to university, and in this case, the diagnostic information from the tests is used to measure students' learning and thinking capacities in the context of a defined programme. Depending on the outcomes, appropriate placement is done and support provided.

Though set against this progressive backdrop, research has still signalled some elements in the academic development field that cause lecturers, foundation programme providers and researchers to unwittingly compound the situation and even create new challenges for under-prepared students. This can occur even after they have been assessed for proficiency, admitted to higher education and appropriately placed in their first year of study. This study is particularly interested in the notion that there is a propensity to 'locate the problem in the individual' and an attempt to change them without trying to understand the way the system works in relation to that individual (Boughey 2010). Furthermore, this research points to the *over-focus* on exploring student-centred engagement, learning and teaching methods and the acquisition of academic skills, at the expense of focusing on the *knowledge* itself that is the actual subject of the learning (Clarence 2014). This knowledge is the object that is meant to shape both the learning and the skills that need to be acquired, therefore the lack of a deeper theoretical understanding of how this knowledge is structured may hinder the efforts that relevant interventions, such as foundation programmes, use to address under-preparedness.

There is, therefore, a need to keep the actual knowledge as a crucial aspect of understanding student strengths and deficiencies, as well as an important contribution to the foundation curriculum. Using relatively new theories and social realist tools such as Legitimation Code Theory (LCT) enables a study of the underlying structure of the knowledge itself, offering an insight into what is deemed to be its 'legitimate' indicators for success, status and achievement. By focusing on the structures that lie beneath the surface appearances of knowledge, LCT aims at revealing the tacit principles embodied by these knowledge practices, and is capable of providing often hidden 'knowledge about knowledge' (Maton & Moore 2010). In addition, LCT theorists further propose that knowledge itself is an artefact that ought to take centre stage, allowing an exploration into the characteristics that enable it to be created and developed over time and the modes of its creation and development. This emphasis on structural knowledge enables an exploration of the said knowledge's effect on educational policies and practices (Maton & Moore 2010). In addition, it allows the areas of *over-focus* such as those outlined above to be brought into relation with the analysis of students themselves, enabling the comparison of different contexts and analysis of change over time without the clutter of empirical differences (Howard & Maton 2011).

This paper offers an analysis of the test-taker performance on a National Benchmark Test (NBT) Academic Literacy (AL) assessment using LCT and illustrated by semantic waves in particular. The scores of this test are reported empirically and categorised as Proficient (68% and above), Intermediate (between 67% and 39%) and Basic (below 38%). The Intermediate and Basic students have been proven to require additional intervention such as foundation courses to allow them to achieve their qualifications (Griesel 2006). An analysis of performance on the test using LCT will enable us to explore the knowledge structure that underpins the NBT AL, its indicators for success and how it relates to the test-takers. This information would be a crucial complement to the predictive and diagnostic information that a foundation programme provider gets, information that would assist in zoning in on specific areas of under-preparedness.

I will proceed by proposing a translator based on concepts of LCT with which the structural knowledge of the NBT AL can be explored. The translator will enable us to extract what the design of the test is proposing as the legitimate knowledge. This will be followed by the exploration of a *semantic*

wave which will act as an illustration of how the translator can be used. To effect this illustration, I will look at the performance patterns of an NBT AL test-taker cohort, mapping them against the legitimated test requirements. Since there can be several permutations to reading test-taker results using this type of analysis, I will focus on the test-takers' self-declared home language as the main variable for categories for analysis.

The report of the Council on Higher Education Task Team on Undergraduate Curriculum Structure (2013) concurred with the notion that the largest disparities in performance in higher education are associated with the pervasive effects of historical racial discrimination. They subsequently conducted a study to disaggregate the performance of a first-time entering cohort by population groups. Although overall performance was not good across all racial groups (32% success rate for Black African students for a 3-year degree; 29% for Coloured, 32% for Indian and 51% for White), it was noted that Black African student performance remained a significant cause of concern and symptom of under-preparedness. Building on this, I will categorise the test-takers according to home language, motivated further by the fact that the object of study is a language test. For purposes of this paper, home languages have been compressed into three: English (EN), Afrikaans (AF) and 'Black African Languages' (BAL) to represent the major population groups of the region.

The NBT AL

Being proficient in academic literacies requires students to be able to notice the particularities of academic contexts and ways in which these shape a particular kind of language use, and to be able to develop and use a nuanced approach to language that is aligned with a given context (Cliff 2015). The NBT AL construct, therefore, draws on the applied linguistics theories of Bachman (1990), Bachman and Palmer (1996), Lea (2004) and Yeld (2001) to assess student readiness in two main areas: organisational knowledge (to do with the formal structure of language for the production or comprehension of grammatically acceptable sentences), and pragmatic knowledge (the creation and interpretation of discourse by relating utterances or sentences to their meanings, language use settings as well as intentions of language users). The categories or skill areas that are assessed by the NBT AL are therefore adapted from these two main areas, as follows:

Writer Performance Ranges on the NBT Academic Literacy Test

- *Communicative function*: assessing students' abilities to 'see' how parts of sentences/discourse define other parts; or are examples of ideas or are supports for arguments; or are persuasions.
- *Inferencing*: students' capacities to draw conclusions and apply insights based on what is stated or implied in texts.
- *Vocabulary*: students' abilities to derive/work out word meanings from their context.
- *Relations*: combination of Cohesion - ability to 'see' anaphoric and cataphoric links in text, antecedents and what follows; and Discourse - the capacity to 'see' the structure and organization of discourse and argument (transitions in argument; superordinate and subordinate ideas; introductions and conclusions; logical development).
- *Essential/non-essential*: capacity to 'see' main ideas and supporting detail; statements and examples; facts and opinions; propositions and their arguments; classification, categorization and labelling.
- *Grammar and syntax*: ability to 'see'/analyze the way in which sentence structure/word, phrase order affects meaning and emphasis in language.
- *Metaphor*: capacity to perceive language connotation, word play, ambiguity, idiomatic expressions.
- *Text genre*: ability to perceive 'audience' in text and purpose in writing; ability to understand text register (formality/informality) and tone (didactic/informative/persuasive/etc.).

These categories are further measured by a defined set of NBT cognitive levels, adapted from Bloom's taxonomy (1956). The lowest cognitive level is *knowing*, represented by the code 1+ or 1-. The second level is *applying routine concepts in familiar contexts* (2+/2-); and the third is *applying complex concepts in a variety of contexts* (3+/3-). The most difficult level is *reasoning and reflecting* (4+/4-).

The NBT AL as Test Artefact

The data in Figure 1 below shows the performance of a cohort of test-takers (n=7988) taken from a national NBT writing session in 2015. These students wrote the same form of the NBT AL on the same day, at various venues around South Africa. Of the sample, n=3036 self-report English as Home Language,

n= 256 as Afrikaans and n=4696 as other South African languages, with Zulu, Xhosa, Sotho and Tswana as most common.

The choice of test form used in the study depended on what was made available to the researcher by the NBT Project. The AL test has four sections, and this study focuses only on the first section. The section is made up of seventeen multiple choice questions based on a piece of given text. The actual test/item content was not made available by the NBT Project for publication, therefore, where necessary, the closest possible alternative of item content is given in this study. The raw data is also not presented here, but available for scrutiny from the author.

Figure 1 below is a representation of the overall test-taker performance in Section 1 of this particular AL form, by language group.

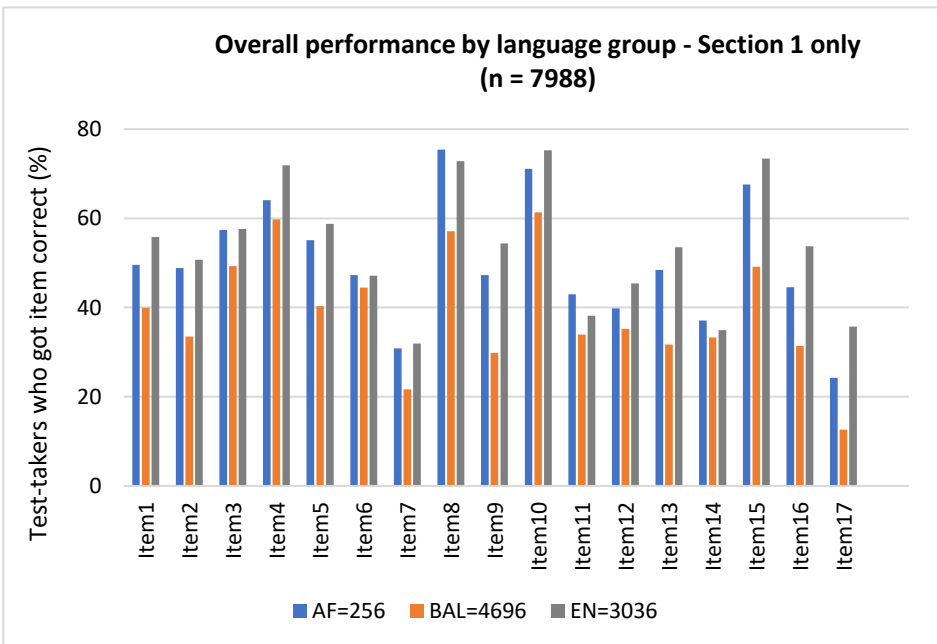


Figure 1: Overall test-taker performance on the NBT AL, Section 1, by language group

Legitimation Code Theory – The Semantic Range

Social realism offers a way of seeing and analysing both knowledge and knowing – together and distinctly (Clarence 2014). Clarence uses the metaphor of ‘digging’ beneath what one can see and experience to look at the events that give rise to these experiences, using the appropriate tools. The digging is necessary for the revelation of the deeper mechanisms that influence experiences, so that educators can begin to find, analyse and understand the elements that shape and influence the experiences of both students and lecturers.

LCT is principally based on studies arising from Bourdieu (1990) and Bernstein’s (1996) theories of knowledge fields and the pedagogic device. Bourdieu’s theory locates knowledge practices as strategies of actors who are positioned in fields of struggle over status and resources. Knowledge is presented as fields that are categorised into three main areas:

- (1) the field of production where ‘new’ knowledge is constructed and positioned;
- (2) the field of recontextualization where discourses from the field of production are selected, appropriated and repositioned to become ‘educational’ knowledge; and
- (3) the field of reproduction where pedagogic practice actually takes place (Maton & Muller 2006).

Maton (2005) enters this context with the suggestion that ‘languages of legitimation’ exist within each field, made up of the viewpoints and practices of the actors within. These languages, also known as codes, provide insight into the legitimate indicators for success, status and achievement, into what is acceptable and valued in the field and which therefore influences dispositions, beliefs and practices of its members. Codes are therefore regulative principles tacitly acquired which select and integrate relevant meanings of knowledge, their forms of realization and their evoking contexts (Bourdieu 1990). The analysis of these languages or codes, (and not pedagogic ideology), then becomes a suitable approach for the discovery of the tacit rules of the game for a particular knowledge structure. In our case, it becomes essential to ensure that the spotlight is not on the under-prepared student alone, but also on the knowledge they are required to acquire.

Maton (2010) further proposes that segmentalism exists in education, where knowledge is so strongly tied to its context that it is only valuable within that particular context. This results in the accumulation of new theories and approaches failing to integrate or even replace existing knowledge in intellectual and educational fields. Consequently, students are unable to cumulatively build on what they have previously learnt and so apply the knowledge to new contexts. This is true for example in the instance that basic education exit examinations are still not the best reflection of a students' ability to cope in higher education, and that most still struggle to transition basic education knowledge into the expected forms in higher education. Maton (2014), therefore, explores the role of knowledge practices in cumulative learning using the concept of *semantic profiling*. This concept allows us to explore the sets of principles underlying a particular knowledge through the coding of its fields as semantic structures. It also enables us to focus more on what is being learned and how it shapes processes of learning. The LCT dimension of Semantics includes both semantic gravity and semantic density, as explained in (Maton 2014: 129).

Semantic gravity (SG) is the degree to which meaning relates to its context in order to make sense, whether that is social or symbolic. Semantic gravity may be relatively stronger (+) or weaker (-). Where semantic gravity is stronger (SG+), meaning is more closely related to its context, where it is weaker (SG-), meaning is less dependent on its context. For instance, therefore, vertical discourse has weaker semantic gravity than horizontal discourse. In addition, the process of weakening semantic gravity means that in a specific context or case, the principles are abstracted from the concrete details, and strengthening semantic gravity means abstract ideas are made more concrete.

Semantic density (SD) is the degree to which meaning is condensed within symbols. Symbols may include terms, concepts, phrases, expressions, gestures, formal definitions, empirical descriptions, feelings, political sensibilities, taste, values, morals and affiliations). As in semantic gravity, semantic density may be relatively stronger (+) or weaker (-). Where it is stronger (SD+), symbols have more meaning, and where it is weaker (SD-), symbols condense less meaning. The process of strengthening semantic density may include condensing a lengthy description into a single term, and weakening semantic density may be when an abstract idea is presented with detailed definitions or empirical descriptions.

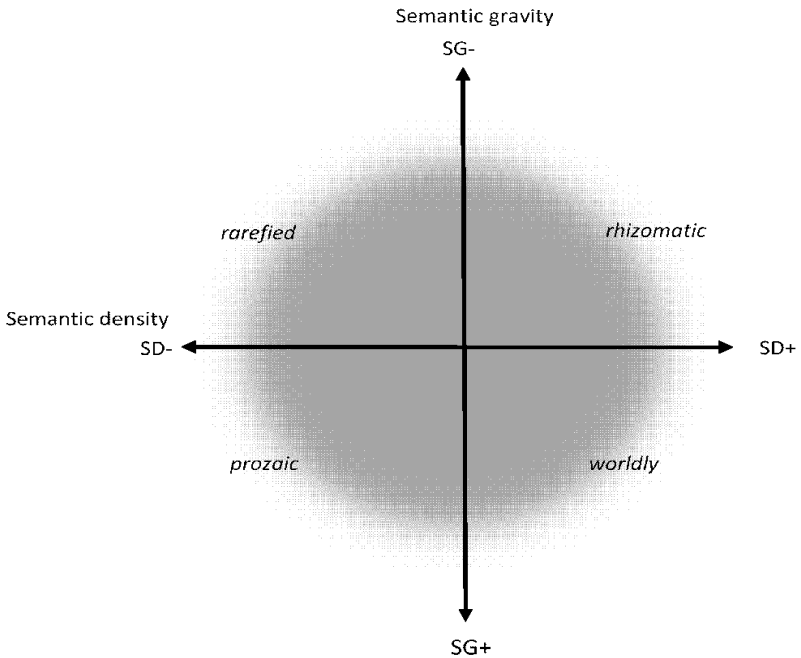


Figure 2. The semantic plane as illustrated by Maton (2016)

The process of strengthening or weakening these two degrees in different permutations generates *semantic codes* that can be visualized as axes on a *semantic plane*, as below:

Figure 2 also shows four principal modalities (Maton 2016) that characterise the semantic plane, adapted for this paper as follows:

- Rarefied codes (SG-, SD-), where items are based on relatively context-independent positions that condense fewer meanings;
- Rhizomatic codes (SG-, SD+), where the test items and their basis of achievement comprise relatively context-independent and complex meanings;
- Worldly codes (SG+, SD+), where items are of relatively context-

dependent positions and condense manifold meanings, and

- Prosaic codes (SG+, SD-), where the items are relatively context-dependent with simpler meanings.

Lastly, our study makes use of semantic waves, which refer to the upward and downward shifts in semantic profiles that characterise classroom practice. These shifts allow, for example, the possibility of transforming knowledge from a simple context to a more complex, more detailed one over time. Semantic waves are a crucial element of cumulative knowledge-building, which is also a required condition for epistemological access and social inclusion into knowledge communities. Clarence (2013) points out that although there is still much research to be done in the field of LCT, we are beginning to understand, using LCT, how cumulative knowledge can be enabled and constrained through pedagogy through these profiles, and this is a crucial area for both research and practice.

A semantic wave may be characterised by a downward movement on one end, which is essentially the ‘unpacking’ of technical terms, concepts or definitions into more familiar common-sense language for students. This can also be described as movement from context-independent symbols whose meanings are relatively abstract. On the other end the inverse upward movement is necessary as a ‘repacking’ process, where engagement with the knowledge is now grappled with using terms and concepts as well as application of theories in own voice, in other words, grappling with context-dependent material that has quite specific meanings. As Maton (2013) discusses, the concept of semantic waves can be used in a variety of ways as a tool to trace changes in knowledge through time.

The External Language of Description

The external language of description as presented in Table 1 is essentially a translation device that I have used to transform one language into another, that is, the translation of several theories into a corresponding LCT code. In the first place, the translator draws from Bachman and Palmer (1996) to outline the general structure of an academic literacy test, the specifications of the knowledge being assessed as well as the skills required in order to achieve the assessment. Secondly, the corresponding NBT AL specifications are mapped onto Bachman and Palmer’s structure, drawing on Yeld (2001). Although the

NBT specifications do not appear to be ranked in any form, this study ranks them according to the language knowledge structures as outlined and categorised by Bachman and Palmer (organisational and pragmatic knowledge categories). This categorisation is further useful when it comes to creating a semantic gravity and semantic density map, as it enables the plotting of varying degrees of context-dependence and meaning condensation for each item.

The resulting semantic range allows us to categorize the seventeen items into four levels of semantic codes. The items right at the top belong to the *rarefied* group of codes on the semantic plane – they have little or no context and are abstract, with relatively simple meanings (SG-,SD-). Such items include vocabulary and grammar categories, assessing abstract concepts and common words used with their common meaning (Maton 2011). The second category has items that fall into the *rhizomatic* code on the semantic range, that is, they also have little or no context, are abstract but have highly complex meanings (SG-, SD+). They include items from the categories of cohesion, relations and inferencing, assessing abstract concepts with specific brief terms or symbols. In terms of language knowledge, these two categories belong to the ‘organizational knowledge’ group, and assess the understanding of the formal structure of language for the production or comprehension of grammatically correct academic language.

The next two levels belong to the ‘pragmatic knowledge’ group and assess the ability to interpret and create discourse by relating utterances or sentences and texts to their meanings. Thus, the third level is made up of items that fall in the *worldly* code on the semantic range – items that have some context but meanings are still abstract and manifold (SG+,SD+). These include the NBT AL categories of essential/non-essential and text genre, characterised by real world examples with specific terms or symbols. The final group is made up of items that are defined by the *prosaic* code on the semantic scale – they are more context-dependent but with more simplified and specific meanings (SG+, SD-). These include the NBT AL categories of communicative function and metaphor, with real world examples and common words used with their common meaning.

Maton (2014) points out that that this weakening and strengthening of codes, or gradation, occurs along a continuum of strengths with an infinite capacity for gradation. The strength or level of condensation is not intrinsic to a particular word itself, but may relate to the semantic structure in which it is located.

Language Knowledge (Bachman and Palmer 1996)		NBT Academic Literacy Test Categories (Adapted from Bachman and Palmer 1996 and Yeld 2001)		Semantics		Code on the Semantic Plane
				Semantic Gravity	Semantic Density	
Organizational Knowledge	Grammatical Vocabulary Morphology Syntax	Produce/comprehend formally accurate utterances/sentences	<p>1. Vocabulary: Ability to derive/work out word meanings</p> <p>2. Grammar: Understanding of how the syntactical, lexical and punctuation features of basic language structures affect academic text meaning</p>	SG- Little or no context, mostly general knowing	SD- Meanings more unpacked, more concrete	SG-, SD- Rarefied Context-independent and simple meanings
	Textual Cohesion Rhetorical organization	Produce/comprehend spoken/written texts that consist of two or more utterances or sentences	<p>3. Relations: a. Cohesion b. Discourse Ability to be able to 'see' anaphoric and cataphoric links in text, as well as other mechanisms that connect parts of text to their antecedents or to what follows.</p> <p>Capacity to 'see' the structure and organization of discourse and argument, by paying attention – within and between paragraphs in text – to transitions in argument, subordinate and subordinate ideas, introductions and conclusions; logical development.</p> <p>4. Inferring: Capacity to draw conclusions and apply insights, either on the basis of what is stated in texts or is implied by these texts.</p>	SG- No or little context given	SD+ Meanings more condensed, abstract	SG-, SD+ Rhizomatic Context-independent but highly complex meanings
Pragmatic Knowledge	Functional knowledge Ideational Manipulative Heuristic Imaginative	Interpret relationships between utterances, sentences/texts; as well as the intention of language users.	<p>5. Essential/non-essential: Capacity to 'see' main ideas and supporting detail; statements and examples; facts and opinions; propositions and their arguments; being able to classify, categorize and 'label'.</p> <p>6. Text genre: Ability to perceive 'audience' in text and purpose in writing, including an ability to understand text register (formality / informality) and tone (didactic / informative / persuasive / etc).</p>	SG+ Context given, some prior knowledge required	SD+ Meanings condensed, abstract	SG+, SD+ Worldly Context-dependent but manifold meanings, still abstract
	Sociolinguistic knowledge (sensitivity to dialect, language variety, register, nativeness criteria); familiarity with cultural references and figures of speech	Create and interpret language to a particular language setting	<p>7. Communicative function: Ability to 'see' how parts of sentences / discourse define other parts; or are examples of ideas or are supports for arguments; or attempt to persuade.</p> <p>8. Metaphor Ability to understand and work with metaphor in language. This includes capacity to perceive language connotation, word play, ambiguity, idiomatic expressions, and so on</p>	SG+ Context-dependent, prior knowledge	SD- Meanings unpacked, more concrete	Prosic More context dependent but with simplified, more specific meanings

Writer Performance Ranges on the NBT Academic Literacy Test

The process might also involve relations to other meanings as part of compositional and taxonomic structures as well as explanatory processes. This means, for example, that whereas ‘vocabulary’ in the NBT AL specification may be described as the derivation of known and unknown vocabulary (with context or no context given) and the understanding of sentence structure (with context given), in the location of the semantic structure, ‘vocabulary’ is simply categorised as having little or no context, general knowing and abstract. This categorisation is based on the position that ‘vocabulary’ takes on the semantic continuum specific to the NBT AL and in relation to the other item categories, for example ‘metaphor’, which is categorised as having a greater degree of context-dependence and where meaning is more specific.

The translator is tabulated as on the previous page.

The first part of the analysis mapped the seventeen items from the AL test form onto the translator, thereby ranking them by NBT AL category, and against the appropriate semantic code on the semantic range. The translated information is tabulated as follows:

Table 2. External Language of Description – with NBT AL

Language Knowledge	NBT AL Category	NBT AL - Section 1 (17 Items)																	Semantic gravity and density			
		Item #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Semantic Code	Description	
Organizational Knowledge	Vocabulary									x				x						SG-, SD-	Context-independent and simple meanings	
	Grammar			x														x				
	Relations										x	x										
	Inferencing				x			x						x								
Pragmatic Knowledge	Essential/non-essential		x			x		x														
	Text genre																		x	x		
	Communicative Function		x				x															
	Metaphor																			x		

When the items are linked together, a semantic wave is formed, showing the movement of the items from context-independent and abstract meanings, to context-dependent with meanings that are more unpacked. It is important to

note that there is no ‘right’ or ‘wrong’ semantic wave, in our case, it is merely an instrument used to read the structure of the test. A test-developer, though, might decide to design a test to follow a prescribed semantic wave.

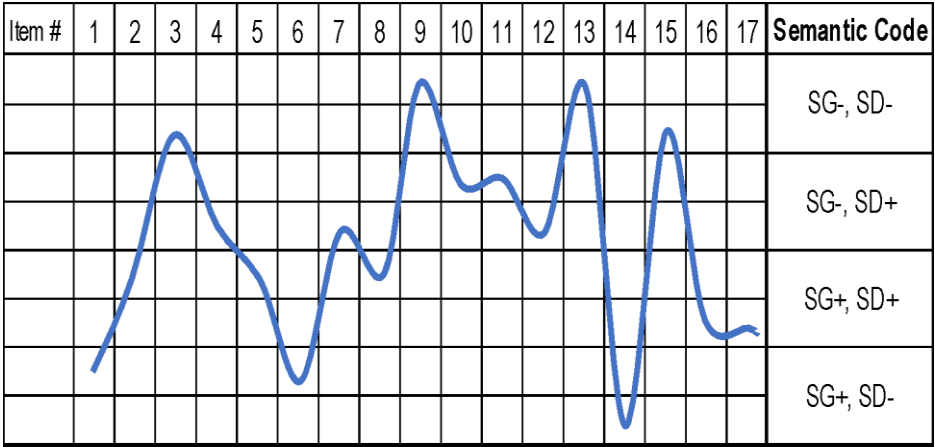


Figure 3. Semantic Profile of the NBT AL items

This resulting wave, therefore, is the visual that represents the ‘legitimate’ knowledge that the NBT AL is assessing. The wave summarises the three main theoretical concepts that I have used in the translator, and therefore becomes a simpler tool to use in reading the structure of the test at a glance. It shows that the test begins with a context-dependent item assessing a specific meaning, moves on to another context-dependent but abstract item, and then on to a general knowing question, and so on. At one end of the semantic plane would therefore be items 9 and 13 (**vocabulary**), where context does not really play a role and what is required is general knowing of a word or group of words. On the opposite end of the plane would be item 14 (**metaphor**), where meaning (or response to it) will be highly dependent on a specific given context.

The second part of the analysis looks at the performance of the test-takers on these items by language group; AF (Afrikaans), BAL (Black African Languages) and EN (English). Starting at the top of the translating tool, four items fall in the *rarefied code* semantic range: items 3, 9, 13 and 15. These items comprise of items from the organizational knowledge group – **grammar** and **vocabulary**. The Figure 4 below shows that overall, more than half of the

Writer Performance Ranges on the NBT Academic Literacy Test

English and Afrikaans test-takers chose the correct option. Less than half of the Black African Language cohort chose the correct option in each case. The worst performed item in this section is item 9 (*In paragraph 4, what word could replace the word 'usurped' without changing the meaning of the sentence?*). Only 30% of non-English and 47% of the Afrikaans speakers appear to know (or successfully guess) the correct option.

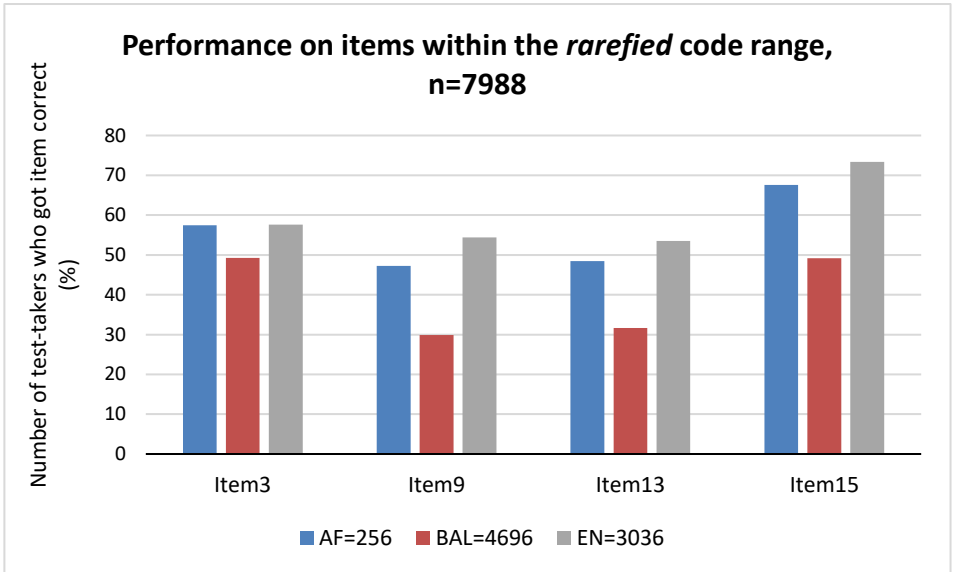


Figure 4: Performance on the items falling within the *rarefied* code range (SG-,SD-)

In the *rhizomatic* code range, the items also fall in the organizational knowledge category, are context-dependent but with highly complex meanings. As may be observed from Figure 5 below, item 7 (*inferencing*) is quite concerning, as it is the worst performed in all language groups, with 31% of Afrikaans, 22% of Black African Languages and 32% of the English test-takers choosing the correct option. The actual item stem reads: *The term 'gunboat diplomacy' represents the contradiction between aggressive enforcement of one's position and...*. The literacy skill required here is the

ability to draw conclusions or give insight based on what is stated or implied by the text. It is clear that the item proved difficult for the majority. Items 4 and 12 are also assessing *inferencing*, and whereas the performance on item 4 is quite good across all language groups, item 12 proves to be difficult for all groups, with 40% of Afrikaans, 35% of the Black African Languages and 45% of the English test-takers choosing the correct option.

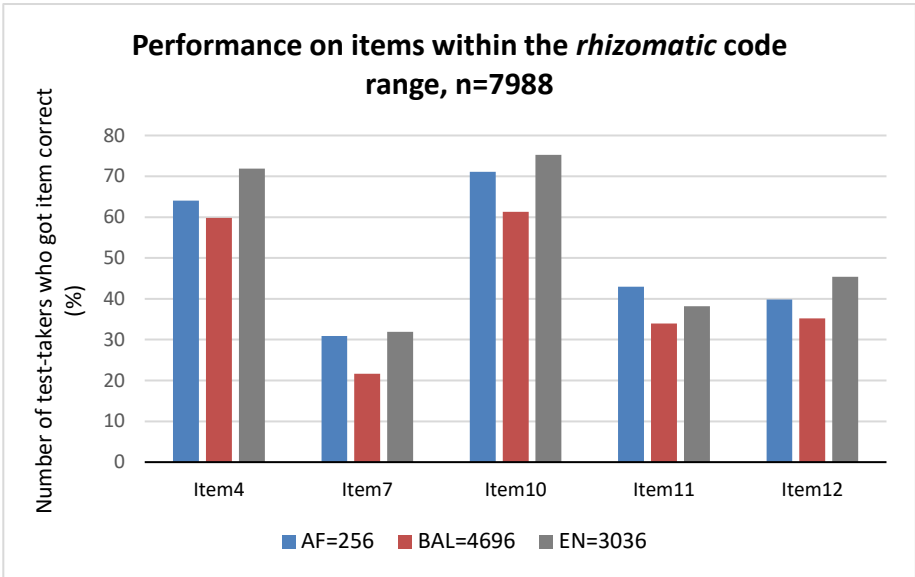


Figure 5. Performance on the items falling within the *rhizomatic code* range (SG-,SD+)

The next level is comprised of items from the *worldly code* range of the semantic plane, (SG+, SD+), where legitimacy is related to context-dependent practices that condense manifold meanings (Figure 6). The items all fall under the pragmatic knowledge category, and items 2, 5 and 8 are assessing *essential/non-essential*. Performance on these items shows that majority of the Black African Languages cohort, followed by Afrikaans, struggled with these items. Item number 2 (*The main idea of paragraph 2 is...*) is to be noted, with

Writer Performance Ranges on the NBT Academic Literacy Test

49% of Afrikaans, 34% of the Black African Languages and 51% of the English cohort choosing the correct option. Items 16 (*What is the overall purpose of this text?*) and 17 (*Where would one find this text in a newspaper?*) are assessing **text genre**, and it is also interesting to note that 73% and 36% of the English language group chose the correct option respectively, followed by the Afrikaans group at 75% and 24%; and the Black African Languages group with only 57% and 13% respectively.

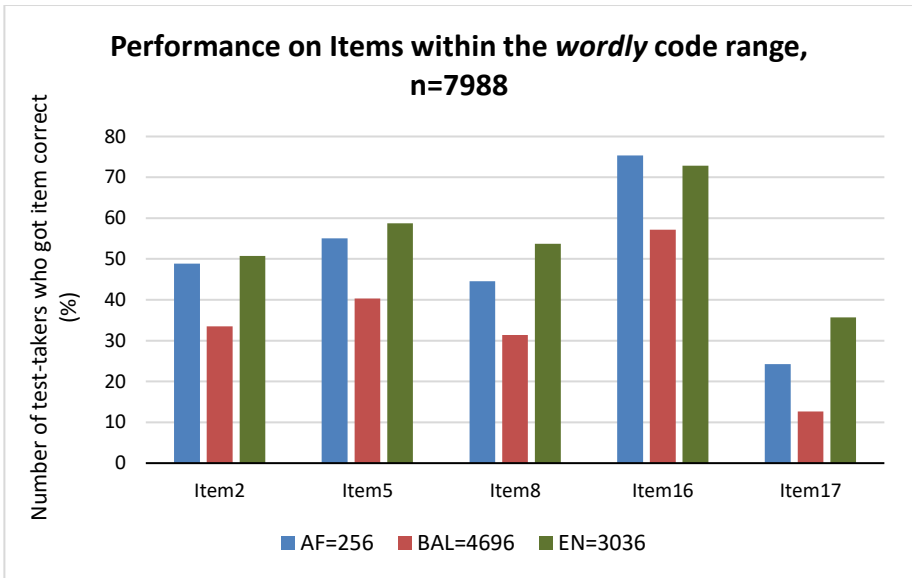


Figure 6. Performance on the items falling within the *worldly code* range (SG+,SD+)

The fourth and final category on the semantic plane belongs to the *prosaic codes* (SG+, SD-) group, where items 1 and 6 (**communicative function**) and 14 (**metaphor**) are more context-dependent but with simpler meanings. Figure 7 shows that performance on item 14 was problematic for all language groups with Afrikaans at 37%, Black African Languages at 33% and the English group at 36% of test-takers choosing the correct option.

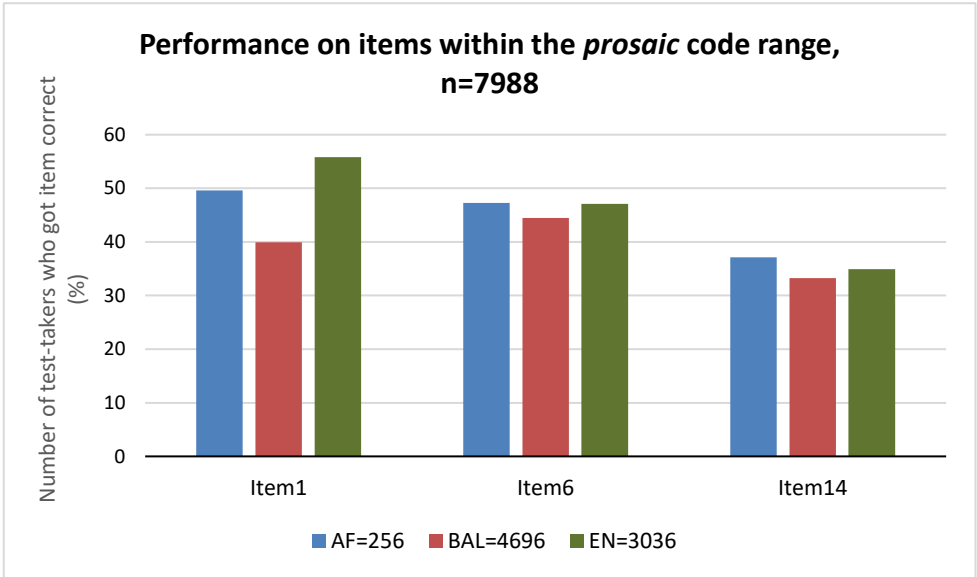


Figure 7. Performance on the items falling within the *prosaic code* range (SG+,SD-)

Having now seen the performance of individual items and where they fall structurally on the semantic plane, the next step would be to see what kind of story the item semantic wave in conjunction with the overall test-taker performance may be telling us.

When it comes to the English language group, over half of the writers are able to grasp the movement from a pragmatic knowledge item that is context dependent but simplified (SG+, SD-: *communicative function*), up towards one that is more complex (SG+,SD+: *essential/non-essential*). Still, over half are able to grapple with the next item all the way up the wave that falls under organisational knowledge, is context-independent with simple meanings (grammar), and back down the wave to the next item that is context-independent but has highly complex meanings (SG-SD+: *inferencing*), and so on. The major dips for this language group exist in two categories: items categorised as organisational knowledge (textual), context-independent but

with highly complex meanings (SG-SD+), and items categorised as pragmatic knowledge (sociolinguistic), more context dependent but with simplified, more specific meanings (SG+,SD-). If, therefore, a student from this cohort were to be placed on an extended programme, these particular areas of academic literacy would benefit from additional support.

The performance pattern of the Afrikaans group of writers is quite similar to the English one. The Black African Languages cohort, however, starts off with poor performance at the beginning of the wave and generally stays that way. The peaks where more than half of the test-takers choose the correct options come in only at the organisational knowledge category (textual), context-independent but with highly complex meanings (SG-SD+), and at the pragmatic knowledge category (functional), context-dependent but with manifold meanings (SG+,SD+). Based on this analysis alone, it would be concluded, therefore, that students from this cohort will need additional assistance in most, if not all areas of academic literacy.

Conclusion

The study attempted an analysis of test-taker performance on an NBT AL paper with the aim of teasing out additional information that can be of use to a foundation programme provider. The paper focused on overall performance on only one section of a specific test form, therefore it is important to remember that there are three other sections that might change the overall picture if included in a more detailed study. Although the trends give an insight into the inadequacies of the test-takers, these patterns might become more evident if the whole test is mapped out in this way. The paper also did not include other aspects of interest that might also be a subject for further research, for instance, the inclusion of performance boundaries (Basic, Intermediate and Proficient), with the Basic and Intermediate groups being the principal beneficiaries of extended programmes.

The paper looked at how LCT can be used to analyse both test and student data by creating a translator that enabled the categorisation of both. The item data was partially categorised by existing NBT AL specifications. I added to this categorisation by extending it with a map adapted from a corresponding semantic range, creating codes that gave us an insight into the underlying structure of the items. I was able to see from the coding that the two main categories that academic literacies are bound in, (organizational and pragmatic

knowledge), are characterised by specific and corresponding codes on the semantic range. Therefore, a pragmatic knowledge item falling under the *metaphor* NBT AL category would require the test-taker to have some knowledge of cultural conventions and references, for example. In semantic terms, the profile I have created confirms that such an item would indeed be context-dependent (e.g. a cultural reference) and the symbol would be specific in nature (e.g. a proverb). Finally, I looked at test-taker performance mapped against this translator to determine the extent to which three different language cohorts are able to grapple with material that is pegged at each level.

Even though an empirical analysis of the NBT AL is well capable of identifying weak performance on the items, the LCT analysis may be used as a visual aid that first summarises the different structural categories of the knowledge that makes up the test, and secondly, allows the mapping of individual or group test-taker performances with the aim of teasing out problem areas. Such an aid would be relevant in the exploration of innovative and creative research that seeks to complement meaningful provision of foundation programme support.

References

- Bachman, L.F. & L. Angeles 2002. Some Reflections on Task-based Language Performance Assessment. SAGE. *Language Testing* 19: 453 - 463. Available at: <https://doi.org/10.1191/0265532202lt240oa>
- Bachman, L.F., & A. Palmer 1996. *Language Testing in Practice: Designing and Developing Useful Language Tests*. OUP: Oxford.
- Badenhorst, E. 2008. *An Exploration of Mediation in an Intervention Programme for Educationally Disadvantaged Medical Students*. Unpublished Master's Thesis, University of Cape Town.
- Bernstein, B. 1996. *Pedagogy, Symbolic Control and Identity*. London: Taylor & Francis.
- Bloom, B.S. (ed.) 1956. *Taxonomy of Educational Objectives. Volume 1*. New York: David McKay Company.
- Bouhey, C. 2000. Multiple Metaphors in an Understanding of Academic Literacy. *Teachers and Teaching* 6, 3: 279 - 290. Available at: http://eprints.ru.ac.za/1123/1/bouhey_multiple_metaphors_in_an_understanding.pdf

<https://doi.org/10.1080/713698740>

- Bourdieu, P. 1990. *The Logic of Practice*. Cambridge: Polity.
- Carelse, C. 2011. Teaching and Learning Strategies Aimed at Facilitating Epistemological Access to the Bachelor of Social Work Degree. In Bozalek, V., J. Garraway & S. McKenna (eds.): *Case Studies of Epistemological Access in Foundation/ Extended Curriculum Programme Studies in South Africa*. HELTASA.
- <http://heltasa.org.za/foundation/>
- Clarence, S. 2013. *Enabling Cumulative Knowledge-building through Teaching: A Legitimation Code Theory Analysis of Pedagogic Practice in Law and Political Science*. Unpublished PHD Thesis, Rhodes University.
- Clarence, S. 2014. Surfing the Waves of Learning ? Exploring the Possibility of Enabling Greater Cumulative Knowledge Building through Pedagogy Using Semantics. Paper delivered at HECU7, Lancaster, July 2014.
- Cliff, A. 2014. Entry-level Students' Reading Abilities and What these Abilities Might Mean for Academic Readiness. *Language Matters* 45, 3: 313-324. <https://doi.org/10.1080/10228195.2014.958519>
- Cliff, A., & E. Montero 2009. The Balance between Excellence and Equity in Admissions Tests: Contributions of Experiences in South Africa and Costa Rica. *Ibero-American Journal of Educational Evaluation* 3: 8 - 28.
- Cliff, A., K. Ramaboa & C. Pearce 2007. The Assessment of Entry-level Students' Academic Literacy: Does it Matter ? *Ensovoort* Special Edition 11, 2.
- Cliff, A. 2015. The National Benchmark Test in Academic Literacy: How Might it be Used to Support Teaching in Higher Education? *Language Matters* 46. <https://doi.org/10.1080/10228195.2015.1027505>
- Griesel, H. (ed.). 2006. *Access and Entry Level Benchmarks: The National Benchmark Tests Project*. Pretoria: Higher Education South Africa.
- Herbert, M., C. Conana, T. Volkwyn & D. Marshall 2011. Multiple Modes of Epistemological Access in Physics. In Bozalek, V., J. Garraway & S. McKenna, S (eds.): *Case Studies of Epistemological Access in Foundation/ Extended Curriculum Programme Studies in South Africa*. HELTASA. <http://heltasa.org.za/foundation/>
- Hutchings, C., & J. Garraway (eds.). 2010. *Beyond the University Gates: Provision of Extended Curriculum Programmes in South Africa*. Rhodes University Foundation seminar hosted by Chrissie Boughey. 2009. <http://heltasa.org.za/foundation/>

- Jacobs, C. 2013. Academic Literacies and the Question of Knowledge. *Journal for Language Teaching* 47, 2: 127 - 139.
<https://doi.org/10.4314/jlt.v47i2.7>
- Jacobs, M. 2010. A Framework for the Placement of University Students in Science Programmes. *Higher Education* 355.
- Macnaught, L., K. Maton, J. Martin & E. Matruglio 2013. Jointly Constructing Semantic Waves: Implications for Teacher Training. *Linguistics and Education* 24, 1: 50 - 63. <http://doi.org/10.1016/j.linged.2012.11.008>
- Maton, K. 2000. *Beyond Bourdieu and Bernstein: Legitimation Code Theory*. University of Sydney. http://www.ucd.ie/t4cms/teaching_lct_intro.pdf (Accessed November 2018.)
- Maton, K. 2005. Fracturing autonomy: Bourdieu and Contemporary Changes to the Higher Education Community. *Proceedings of the Australian Sociological Association Annual Conference*, University of Tasmania. December, 2005.
- Maton, K. 2010. *Reclaiming Knowers: Advancing Bernstein's Sociology of Knowledge*. University of Sydney Press.
Available at:
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.470.7136&rep=rep1&type=pdf> (Accessed November 2018.)
- Maton, K. 2010. Segmentalism: The Problem of Building Knowledge and Creating Knowers. In Fandji, D. & P. Vitale (eds): *Knowledge, Pedagogy & Society: International Perspectives on Basil Bernstein's Sociology of Education*. Abingdon. Routledge.
- Maton, K. 2013. Making Semantic Waves: A Key to Cumulative Knowledge-building. *Linguistics and Education* 24, 1: 8 - 22. Available at:
<http://doi.org/10.1016/j.linged.2012.11.005>
- Maton, K. 2014. Building Powerful Knowledge: The Significance of Semantic Waves. In Rata, E. & B. Barrett (eds.): *Knowledge and the Future of the Curriculum: International Studies in Social Realism*. London: Palgrave MacMillan. https://doi.org/10.1057/9781137429261_12
- Matruglio, E., K. Maton & J. Martin 2013. Time Travel: The Role of Temporality in Enabling Semantic Waves in Secondary School Teaching. *Linguistics and Education* 24, 1:38 - 49.
<http://doi.org/10.1016/j.linged.2012.11.007>
- Scott, I., N. Ndebele, N. Badsha, B. Figaji, W. Gevers & B. Pityana. 2013. *A Proposal for Undergraduate Curriculum Reform in South Africa: The*
-

Writer Performance Ranges on the NBT Academic Literacy Test

Case for a Flexible Curriculum Structure. Pretoria: Council on Higher Education.

- Moore, R. 2004. *Education and Society, Issues and explanations in the Sociology of Knowledge.* Cambridge: Polity Press.
- Singh, B.V. 2013. *What does Gravity, Density and Waves have to do with Pharmacy Education?* Unpublished PhD Thesis. University of Kwa-Zulu Natal.
- Van Wyk, A.L. & W. Greyling 2012. Developing Reading in a First-year Academic Literacy Course. *Stellenbosch Papers in Linguistics* 38,0: 205 - 219. <https://doi.org/10.5774/38-0-30>
- Weideman, A. 2003. Assessing and Developing Academic Literacy. *Per Linguam* 19, 1 & 2: 55 - 65. <https://doi.org/10.5785/19-1-89>
- Yeld, N. 2001. *Assessment, Equity and Language of Learning: Key Issues for Higher Education Selection in South Africa.* Unpublished PhD thesis, University of Cape Town.

Naomi Msusa
Consultant, Test Administration
Centre for Educational Testing for Access and Placement,
Centre for Higher Education
University of Cape Town
naomi.msusa@uct.ac.za