An Online Reading Protocol to Research Readers' Reactions to Text

Nick Moore

Abstract

The research study reported here challenges the view, based on a positivist determinist and representationist paradigms, that texts merely convey writers' meanings. Rather, it proposes that a phenomenological approach that situates the researcher and respondent as enactive in the construal of the research process itself will produce valid results. In order to verify a linguistic model of text, the researcher employed a novel approach to Applied Linguistics research to maximize the number of respondents. A reading protocol was hosted on the internet in order to elicit reader's perceptions of texts which produced a far greater range of valid responses than typical Applied Linguistics research projects, responding to the common criticism of poor generalisability of phenomenological and Applied Linguistics research due to small sample sizes.

Keywords: phenomenology; positivism; research; reading; information structure

Introduction

This paper outlines a research project that attempted to combine a phenomenological research design with a systemic functional approach to language. The first section briefly discusses background issues relating to positivist, post-structuralist and phenomenological research in Second Language Acquisition and English Language Teaching. The second section outlines the research project and its results, and the third section is a short conclusion.

Empirical research in applied linguistics based on positivist principles

Second language acquisition (SLA) research typically takes a positivist approach to empirical studies. Positivism requires a researcher to measure the world that exists independently of the researcher. From this perspective we emphasise the importance of objectivity, replicability and generalisability. A positivist approach depends on the assumption that there is a distinction between objective and subjective perspectives; that there is an explanation of the world that is the correct one and it exists without people. The modern version of this position derives from Descartes. The Cartesian principle *cogito ergo sum*, or "I think therefore I am," privileges reason over emotion. It provided the philosophical foundation for the expansion of scientific understanding in the modern era, and influenced a wide range of scholars from Newton to Chomsky.

The aim of a positivist experiment is to measure the world 'out there' with instruments that operate independently of the operator. The result, in a positivist paradigm, is a measurement of reality that can be expressed independently of an observer. As the dominant ideology in the early twentieth century, positivism was a requirement for any new discipline wishing to promote itself as a science. Consequently, the new sciences of the mind (psychology and schools of linguistics that see themselves as sub-disciplines of psychology) eagerly adopted the experimental method derived from classic physics and chemistry laboratories to their own ends (Jones & Elcock, 2001), despite the contradiction between a methodology that attempts to measure physical phenomena and a philosophy that maintains that the mind is a non-physical entity (Edelman, 2004).

Throughout the 20th century, however, positivist philosophies have faced growing criticism. Perhaps the greatest problem with positivism, particularly Cartesian dualism, is that it is unable to recombine the schism created between the physical and metaphysical, between the objective and the subjective or between the mind and body (Vernon & Furlong, 2007). That is, positivist explanations deny the role of the theorist or observer in their explanations. They attempt to describe a world that is devoid of observers, as if observers play no role in the world. Fundamentally, however, there can be no measurement without an observer, who not only

chooses the method and object of measurement, but is part of the world that is being measured. That is, the metaphysical mind must be reducible to the physical brain, objects are always measured by subjects, and the physical world provides the environment for the body which provides the environment for the brain.

In linguistics and applied linguistics, there has been little criticism of the positivist approach, even though the natural sciences, (physics and biology, in particular) have developed theories that reject positivism. Rather there are positivistic, paradigmatic assumptions that have often guided AL research: a quest for ultimate rules or universals regarding SLA; a conviction that such rules have a measurable reality or ontology independent of the rational, scientific frames and tools used to discover them; and an assumption that such research methods, if not culturally and ideologically neutral, are at least controllable through experimental design (Morgan, 2007, p. 950).

Applied Linguistics research is positivist in its orientation because it typically assumes that there exists a model of language which language learners must acquire, that the acquisition process is measurable independent of the observer, and that the perspectives of those involved in the process are less significant than the perspective of the researcher: "Linguists, however, are not trained to take any perspective other than that of the analyst (that is, themself) into account." (Poynton, 2000, p. 29).

Despite the significant developments made in science and technology from a positivist perspective, the 20th century has witnessed a challenge to positivism that cannot be ignored. The traditional philosophical reaction to the positivist paradigm, a realist position, is that of idealism. This largely-discredited approach defines reality by our perception of it. Idealists propose that we create our own reality. This results in a relativistic position where there can be no objective truth – just different, equally-valid versions of the truth. There is, however, another response.

An empirical approach based on phenomenological principles

The philosophical tradition that may best provide an escape from the realist-idealist impasse is phenomenology. Phenomenology does not suggest that humans can never agree on a scientific description of the world. Neither does it allow a reality to exist independently of an observer; every act of observation necessarily entails an observer. A phenomenological perspective requires that the observer's position in relation to the object under study cannot be ignored:

> We play a role in defining reality, but only insofar as it affects us as individuals (the idealist aspect), that is, insofar as it affects our experience of reality; the reality that we perceive does exist (the realist aspect) but our perception and conception of it is conditioned by our experience. Thus, reality is for us a personal experience, though it derives from a common source and this reality is our experience and is contingent upon the current ontological status of us as entities in that universe. As perceivers, our perceptions of the world are a function of what we are: reality is conditioned by experience and experience is conditioned by the nature of the system and its history of interaction with reality. (Vernon & Furlong, 2007, p. 55)

This perspective is represented in physics by relativity and by quantum theory. A biological response to this new perspective is the enactive system of autopoesis (Maturana & Varela, 1987): a genetically re-constituting organism reacts to perturbations in the environment in order to maintain structural balance. The resulting observable 'behaviour' is a consequence of the organism maintaining structural balance – a process made increasingly complex by the addition of an internal nervous system and other similar or dissimilar organisms in the environment. Research from this perspective emphasises validity, processes and relations.

Post-structural Developments in SLA research design

Perhaps the most significant development in SLA and ELT research is the increased interest in qualitative research methods (Holliday, 2007; Richards, 2003). This increased interest parallels similar interest in qualitative research in applied phenomenology studies (Miller & Salkind, 2002; Munhall, 1994), with which qualitative SLA research shares a connection in a post-structuralist approach that phenomenology produced and to which linguistics and applied linguistics have responded (Morgan, 2007).

While a repeat review of research is still sorely needed, little has changed since Nunan's (1991) call for improvements to SLA research. More research studies still need to be naturalistic, a wider range of theoretical bases still need to be (funded and) researched, and classroom teachers still need to be systematically involved in classroom research. Perhaps one area where we have seen a development since Nunan's study is in research methods, with far more value being given to qualitative methods (Richards, 2003; Holliday, 2007). However, this does not necessarily improve research – it only replaces one set of considerations with another (Brown, 2006).

The emic concepts of 'thick description' and the dependence on Dependability, Confirmability, Credibility and Transferability (Brown, 2006) derive from a poststructuralist mistrust of positivist concepts. In applied linguistics this can be seen most clearly in the promotion of participatory pedagogy (Breen, 1987) and research (Allwright, 1993; Allwright & Bailey, 1991), and in the rejection of psychometric testing on the basis that the categories against which so-called objective language tests are measured can no longer be assumed and have yet to be accurately verified (McNamara, 1996). This mistrust, in turn, is the consequence of the phenomenological rejection of positivist science, most sharply portrayed in applied linguistics by Pennycook's (2001) advocacy of Foucault's definition of discourse. In this approach discourse is seen as the method by which power is enacted and legitimised. What none of these approaches propose, however, is a model of language.

A linguistic model for poststructuralist language learning research

The model of language proposed by systemic Functional Linguistics (SFL) naturally lends itself to a poststructuralist paradigm. However, despite the significant influence of the model of language developed within SFL on areas such as English for Specific Purposes (ESP) and genre studies, its presence is noticeably lacking in discussions of research into SLA (Perret, 2000). This may be because the very concept of language acquisition has been critiqued by Halliday, exposing its positivist assumptions:

The implication has been that the learning of structure is really at the heart of the language learning process. And it is perhaps not too far-fetched to recognise in the use of the term acquisition, a further implication that structure, and therefore language itself, is a commodity of some kind that the child has to gain possession of in the course of maturation. (1975, p. 1)

That is, the assumption that there is an identifiable, inviolate object – language – that exists to be acquired by learners is an assumption that is challenged by poststructuralist (McNamara, 1996) and phenomenological (Maturana, 1978) approaches. This is partly reflected in SFL's focus on the process of language development – the developing ability to make ever more delicate meanings rather than the acquisition of a static model of language (Halliday, 1975) – and by a focus on first language literacy projects (Martin, 1993; Rose, Lui-Chivizhe, McKnight, & Smith, 2003; Christie, 2002). It may also be a result of the longitudinal approach to language development typical of SFL studies since Halliday's (1975) breakthrough study of a child's linguistic socialisation.

However, the absence of SFL in second or foreign language literature certainly needs to be addressed on a more regular basis, perhaps with the adoption of small-scale projects that can support Halliday's (1993) view of "a language-based theory of learning" that will also reveal

more of the language development process. This is because SFL is one of the few theories of language that can offer a non-representationist view of language essential to account for a contemporary understanding of brain functions (Edelman, 2004; 1999) and the role of embodiment in learning and operationalising language, understanding and perception (Vernon & Furlong, 2007; Barsalou, 2008; MacWhinney, 1998). In SFL theory, one role of one of the overall functions of language is to *construe* experience (Halliday & Matthiessen, 1999). That is, alongside the roles of enacting social relationships, and instantiating text within a context, SFL proposes that language simultaneously reflects and constitutes our reality, and that language situates ourselves and our understandings of the world:

Of all linguistic models, the systemic view of the two-way determination of the relation between language and context comes closest to current (poststructuralist) understandings, outside linguistics, of the work done by 'language' in constituting (and not just 'expressing') knowledges and persons. (Poynton, 2000, p. 36)

An example of phenomenological research design

The following section describes a research project that attempted to maintain a phenomenological, post-structuralist perspective while developing a non-representationist systemic functional model of language. Despite the tendency for many phenomenological studies to avoid a 'grand theory,' the main aim of science is to generalise experience in order to make predictions, and so even in ethnographic studies – those containing the 'thickest' of descriptions – there is often an attempt to compare and link descriptions from one specific context with another. With this approach in mind, and with the broad criticism of ESP and English for Academic Purposes (EAP) studies that they are frequently ungeneralisable due to typically small sample sizes, I attempted to aggregate the combined perceptions of a wide variety of individuals, so that I could both allow a conception of readability to develop from my respondents (rather than imposing one on them), and accrue enough data to attempt to make generalisations. In other words, I have attempted to enable a significant number of respondents to determine and develop the concepts that are measured in this study.

The experiment investigates the SFL approach to information structure in written text, without requiring texts to be read aloud. In short, readers were presented with two original texts and two texts that were manipulated with the intention of changing the flow of information based on the model developed for a research project which also included qualitative and quantitative discourse analyses. That is, while Reference (Martin, 1992) and Theme (Halliday & Matthiessen, 2004) were kept constant, clause-final and clause-complex-final constituents were moved to non-final rhematic positions in the clause, wherever this was possible and did not produce incongruent or improbable text. Three distracter questions were mixed with two questions to identify readers' perceptions of how well the text presents its main points, and how well it flows. The study was carried out twice. The first attempt acted as a pilot study and partly contributed to verifying that respondents would understand the concepts that they would develop. Changes were made to the structure of the database and one text was changed in the second iteration.

Selection and Manipulation of Texts

The texts selected for this experiment were all samples from representative undergraduate textbooks in the institution where I work – they were all texts that undergraduate engineering students are expected to read. These texts are generally constant for Register (Halliday, 1970; Halliday & Hasan, 1985), but vary slightly in Field and length (see table 1). Texts C and D were presented to all volunteers to provide constant comparison across all respondents. Text C was always presented in its original (+) form, and text D was always presented in its manipulated form (-). Volunteers were also presented with either an original

form (+) of text A and a manipulated form (-) of text B or *vice versa*, as the experimental condition. Sequencing of texts was also controlled for in the experimental design.

Table 1 Details of texts for reading protocol

Text	"Title" (Source) *Field of engineering*	# words (+ & - versions)
A	"Amplifier Noise" (Horowitz & Hill, 1989) *Electronics*	+ 313 - 305
B	"Computer Security" (Coulouris, Dollimore, & Kindberg, 2001) *Computing*	+ 609 - 607
C	"Broadcast Networks" (Coope, Cowley, & Willis, 2002) *Communications*	+ 381
D	"The File Service Interface" (Tannenbaum, 1995) *Software*	- 657

Original texts were presumed to be designed by their writers to have the optimal flow of information as a natural result of language choices, and the drafting and editorial processes typical of published material. Consequently, the changes that were introduced were assumed to disrupt this flow in some way. The manipulation of the texts consisted only of a change in the Rhemes of the clauses. The changes in the texts were judged minimal and as unobtrusive as possible. Table 2 highlights some typical changes. As the example demonstrates, in most cases the manipulation is merely a reordering of post-verbal groups, especially those in a paratactic relationship (Halliday & Matthiessen, 2004), although in some cases manipulation involved the manipulation of the internal structure of a group to provide more or less post-nominal modification.

Table 2 Example of text manipulations

Original (+)	Manipulated (-)
Security measures must be incorporated into computer systems whenever they are potential targets for **malicious or mischievous attacks**. This is especially so for systems that handle financial transactions or **confidential, classified or other information whose secrecy and integrity are critical**. In Figure 7.1, we summarize **the evolution of security needs in computer systems** since they first arose with the advent of shared data in multi-user timesharing systems of **the 1960s and 70s**. Today the advent of wide-area, open distributed systems has resulted in a wide range of security issues. (89 words)	Security measures must be incorporated into computer systems whenever they are potential targets for **attacks that are malicious or mischievous**. This is especially so for systems that handle confidential, classified or other information whose secrecy and integrity are critical, **or financial transactions**. In Figure 7.1, we summarize **the evolution of computer system security needs** since they first arose in the 1960s and 70s with **the advent of multi-user timesharing systems with shared data**. Today the advent of wide-area, open distributed systems has resulted in a wide range of security issues. (90 words)

Selection of Respondents and Distribution across Conditions

The research project needed to find as many readers as possible to evaluate the texts. Since the project had no budget, and was dispersed across a number of geographical locations, the internet seemed the most appropriate tool to find potential readers. The main target

population group are readers with familiarity of academic text, since all of the samples were from an academic register. Readers known to the researcher as language-learning students of engineering, as language teachers, as engineering faculty and as friends were selected for the pilot study. They were joined by those with access to the University of Liverpool virtual noticeboard (mainly faculty, staff and students on all parts of the campus) for the full study, but no more than 10 participated in both studies. This approach produced a sample of respondents that was far greater than would typically be expected in an EAP research study and so allows for greater generalisablity. Because of issues of identity on the internet, demographic factors were controlled for on a post-hoc basis. Some data sets were rejected on rigorous criteria in various post-hoc procedures that are too involved for full description here.

Description of Questions

Each text was presented to respondents with the 5 questions in table 3. The main questions that were designed to evaluate the hypotheses were the subjective response questions in 2 and 3. These required respondents to evaluate the text in terms of progression of ideas. Question 2 asked respondents to respond to the statement "The text presents its main points clearly". This question looked at the text as a whole, and focused the respondent on the main ideas, assumed to be found at the point hypothesised to be ideal for presenting New information. This was the location of the manipulation of the text, and was hypothesised to be the main area of difference between the Original (+) and Manipulated (-) versions of the texts. Question 3 asked respondents to respond to the statement "The text progresses easily from one point to the next", and looked at the same area of meaning, but focused the respondent more locally at the clause level rather than at the level of text as a whole, as in question 2. It was hypothesised that responses to questions 2 and 3 between the Manipulated (-) and Original (+) versions of the texts would reveal a significant difference. Importantly, in both of the key questions, there was no attempt to define the concept in advance or lead the respondents in determining the concept of readability; each reader was left to decide what a 'clear presentation of the main points' and 'easy progression from one point to the next' might entail and respond on a rating scale.

Question 4 ("The text could be made easier to read") was intended as a check for the answers to questions 2 and 3. An inverse correlation between the answer score for question 4 and the total of questions 2 and 3 was expected. A strong correlation was one factor that resulted in the rejection of the data set. Questions 1 ("What do you think is the main idea of this text?") and 5 ("Choose the best title for this text") served largely to distract attention from questions 2 and 3. These questions appeared to be more 'typical' comprehension type questions familiar from language study or language learning contexts. Without these questions the main aim of the study would appear more obvious to the respondents who could then choose to subvert or comply with the main aim of the research, rather than responding more naturally to the questions. Question 5, in particular, distracted attention by looking as though there was a "right" answer. The answers to these 2 questions were only used as a check, and a possible cause for rejection of the data set, for respondents whose other answers appeared to be irregular.

Table 3 Questions in reading protocol

1. *What do you think is the main idea of this text?*					
Indicate how much you agree or disagree with statements 2-4. 2. The text presents its main points clearly.					
○	○	○	○	○	○
Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
3. The text progresses easily from one point to the next.					
○	○	○	○	○	○
Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
4. This text could be made easier to read.					
○	○	○	○	○	○
Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
5. *Choose the best title for this text. (e.g.)*					
○		○		○	
"Methods of Serving Files"		"Choosing a File"		"The File Service Int rface"	

Analysis of Results

In total, 373 respondents started the reading protocol, 253 finished the first reading text and 198 finished all four reading texts. In general, about 5-10% of readers dropped out after the first text and 5% or less per text thereafter.

Table 4 shows the number of respondents for each text (in brackets) and provides a summary of the main results, which are analysed below. The figures given are those that focus on the main topic of research: reader perceptions of the 'ease' of reading for each text (from question 2) and how well the text shows 'progress' (from question 3).

Table 4 Summary of selected results for reading protocol

Text (n) original = + modified = -	A+ (127)	A- (94)	B+ (94)	B- (106)	C+ (224)	D- (216)
Mean 'ease'	2.993	2.67	2.138	2.812	3.393	2.699
Mean 'progress'	2.945	2.726	2.138	2.906	3.406	2.676

Statistical analyses were applied to the results according to the null hypotheses outlined below. As the statements below are expressed as hypotheses, and the population in each case is greater than 30, the t-test was selected as the most appropriate test of significance for these

results (Butler, 1985). A two sample t-test assuming unequal variance was applied. Although none of the scores revealed a true normal distribution, all sets of data revealed a skew within tolerable boundaries for the t-test to be applied.

- Null hypothesis 1: There is no perceived difference in ease of reading between modified and original *texts:*

In the survey, for each text readers were presented with the statement "The text presents its main points clearly", and asked to show their level of agreement on a six-point Likert scale. For ease of reference, this is considered a measure of 'ease of reading'. When comparing readers' perceptions of the ease of reading for the original version of text A with the modified version of text A, $t = 2.045$ ($p=0.05$), giving us some evidence to reject the null hypothesis.

For the comparison between readers' perceptions of the ease of reading for the original and modified versions of text B, $t = -3.318$ ($p=0.05$). This provides us some evidence to reject the null hypothesis. However, the scores are in the opposite direction to expectation. With mean scores of 2.138 for perceived ease of reading for the original version and 2.569 for the modified version, it seems that the modified version of text B appeared easier to readers.

When comparing readers' perceptions of the ease of reading for the original version of text C with the modified version of text D, $t = 5.359$ ($p=0.01$), giving us some evidence to reject the null hypothesis. A comparison of readers' perceptions of the ease of reading of all texts produced $t = 3.953$ ($p=0.01$). Thus we have some evidence that the null hypothesis is false. Further, as the score is positive, the result shows that in general the anomalous data for text B were insufficient to affect the data set as a whole; readers perceived the original versions to be easier to read than the modified versions.

- **Null hypothesis 2:** There is no perceived difference in the progression of ideas between modified and original texts:

For each text, readers were presented with the statement "The text progresses easily from one point to the next", and asked to show their level of agreement on a six-point Likert scale. For ease of reference, this is considered a measure of 'progression of ideas'. When comparing readers' perceptions of progression of ideas between the original and the modified version of text A, $t = 1.284$ ($p=0.2$). We therefore have insufficient evidence to reject the null hypothesis.

When comparing readers' perceptions of the progress of ideas for the original version with the modified version of text B, $t = -3.874$ ($p=0.05$), giving us some evidence to reject the null hypothesis. However, this score was contrary to expectation, suggesting that readers found the modified version of text B showed a clearer progression of ideas than the original version, in much the same way that text B was considered easier to read. Comparing the original version of text C with the modified version of text D, $t = 6.479$ ($p=0.01$), providing us with strong evidence that the null hypothesis is false. When comparing readers' perceptions of the progress of ideas for the original version with the modified version of all texts, the $t = 4.092$ ($p=0.01$), giving us strong evidence to reject the null hypothesis.

Discussion

In general, the null hypotheses were not supported, and can be rejected. That is, there is some evidence to suggest that readers evaluated the original versions of the text more favourably, in terms of the way the texts presented their main ideas, and their progression from one idea to the next, as well as finding them easier to read. It must be remembered that a significant result here is remarkable not least because the changes made to the texts were quite

minor; in some clauses (those with more than one post-verbal element) only the order of some elements (those that did not result in an unnatural clause) was changed. Crucially, there were no changes to Theme (Halliday & Matthiessen, 2004) or to Presenting or Presuming reference (Martin, 1992). These factors combine to suggest that post-verbal ordering within grammatical limits has a significant and independent role in the clause that readers appear to respond to.

Another factor that considerably influences the results is the comparison of texts C and D. These two different texts were used as a comparison against each other because they provided a constant point of comparison across all respondents and all sets. The fact that, regardless of sequence, text C was constantly judged better at presenting its main ideas and progressing from one point to the next may, of course be a result of other factors in the text. This would require a further study where the manipulation of texts was reversed (Texts A and B held constant while C and D vary).

Finally, the apparently anomalous results where the manipulated form of Text B appeared to show better ease of reading and progression of ideas needs to be explained. Although, it was stated earlier that original versions of texts were assumed to be the ideal version, based on the fact that they were published documents subject to the processes of editing and proof-reading, it may in fact be possible to improve on these 'original' texts through the development of a satisfactory model of ease of reading and progression of ideas in text. The research reported in this study is part of such a larger project and as such has contributed to that aim.

Conclusion

It would appear that the reading protocol has demonstrated that the placing of elements in final position in a clause is not a trivial matter. It seems that manipulating the order of elements at the end of the clause can have an effect both on readers' perceptions of the flow of information, in a general and a more specific sense, in a text. What makes this more noticeable is that while the changes made to the texts constitute only a small proportion of the text, they seem to have had a significant effect on readers, perhaps disproportionate to the minor changes that were made to meaning.

More importantly, however, it is the readers' own perceptions that form the basis of this study and, as such, nominate this study as a phenomenological research study. By combining a construal, rather than a representationist model of language, with a research methodology that enables the constructs to be developed by responses, this study has attempted to apply an alternative approach to applied linguistic research. That is, the study enabled the respondents, through their unprompted understanding of the terms involved, to help establish a concept that was not previously assumed to exist. The research methodology situated the reader at the centre of the development of the concepts. The hypothesis-testing approach in the study is unusual for phenomenological studies, but is an attempt to confront the issue of generalisability that confronts many phenomenological (and ESP and EAP) studies. The statistically-based hypothesis-testing research methodology also allows an easier comparison with more traditional SLA studies. Further, as reading for most fluent readers has become such an automatic process, it is difficult to depend on introspective reports or other self-evaluative methodologies typically associated with phenomenological research.

References

Allwright, D. (1993). Integrating 'research' and 'pedagogy': Appropriate criteria and practical possibilities. In J. Edge, & K. Richards, *Teachers Develop and Teachers Research.* Oxford: Heinemann.

Allwright, D., & Bailey, K. (1991). *Focus on the Language Classroom.* Cambridge: Cambridge University Press.

Barsalou, L. (2008). Grounded cognition. *Annual Review of Psychology 59*, 11.1-11.29.

Breen, M. (1987). State of the art article: Contemporary paradigms in syllabus design. Parts 1 & 2. *Language Teaching 20/2 & 20/3* .

Brown, J. (2006). Research Methods for Applied Linguistics: Scope, Characteristics, and Standards. In A. Davies, & C. Elder, *The Handbook of Applied Linguistics* (pp. 476-500). Malden, MA: Blackwell Publishing.

Butler, C. (1985). *Statistics in Linguistics.* Basil Blackwell: Oxford.

Christie, F. (2002). *Classroom Discourse Analysis.* London: Continuum.

Coope, S., Cowley, J., & Willis, N. (2002). *Computer Systems: Archtecture, Networks and Communications.* London: McGraw Hill.

Coulouris, G., Dollimore, J., & Kindberg, T. (2001). *Distributed Systems: Concepts and Designs. 3rd Edition.* Harlow: Pearson.

Edelman, G. (1999). Building a picture of the brain. *Annals of the New York Academy of Sciences 882*, 68-89.

Edelman, G. (2004). *Wider Than the Sky - The Phenomenal Gift of Consciousness.* New Haven: Yale University Press.

Halliday, M. (1970). Language structure and language function. In J. Lyons, *New Horizons in Linguistics* (pp. 140-165). Harmondsworth: Penguin.

Halliday, M. (1975). *Learning How to Mean: Explorations in the Development of Language.* London: Edward Arnold.

Halliday, M. (1993). Towards a language-based theory of learning. *Linguistics and Education 5* , 93-116.

Halliday, M., & Hasan, R. (1985). *Language, Context and Text: Aspects of Language in a Social-Semiotic Perspective.* Victoria: Deakin University Press.

Halliday, M., & Matthiessen, C. (1999). *Construing Experience Through Meaning.* London: (Continuum.

Halliday, M., & Matthiessen, C. (2004). *An Introduction to Functional Grammar (Third Edition).* London: Arnold.

Holliday, A. (2007). *Doing & Writing Qualitative Research.* London: Sage.

Horowitz, P., & Hill, W. (1989). *The Art of Electronics.* Cambridge: Cambridge University Press.

Jones, D., & Elcock, J. (2001). *The Nature and Role of Contemporary Psychology.* London: Arnold.

MacWhinney, B. (1998). Models of the emergence of language. *Annual Review of Psychology 49*, 199-227.

Martin, J. (1992). *English Text.* Amsterdam: John Benjamins.

Martin, J. (1993). Genre and literacy - modeling context in educational linguistics. *Annual Review of Applied Linguistics 13*, 141-172.

Maturana, H. (1978). Bioloy of Language: The Epistemology of Reality. In G. Miller, & E. Lenneberg, *Psychology and Biology of Language and Thought: Essays in Honor of Eric Lenneberg* (pp. 27-63). New York: Academic Press.

Maturana, H., & Varela, F. (1987). *The Tree of Knowledge: The Biological Roots of Human Understanding.* Boston: Shambhala.

McNamara, T. (1996). *Measuring Second Language Performance.* Harlow: Longman.

Miller, D., & Salkind, N. (2002). *Handbook of Research Design and Social Measurement.* Thousand Oaks, CA: Sage.

Morgan, B. (2007). Poststructuralism and Applied Linguistics: Complementary Apporaches to Identity and Culture in ELT. In J. Cummins, & C. Davison, *International Handbook of English Language Teaching. Vol. 2* (pp. 949-968). Norwell, MA: Springer.

Munhall, P. (1994). *Revisioning Phenomenology: Nursing and Health Science research.* New York: Jones & Bartlett Learning.

Nunan, D. (1991). *Second Language Acquisition Research in the Language Classroom.* Retrieved January 6, 2011, from ERIC Web Portal: http://eric.ed.gov/ERICWebPortal/detail?accno=ED367162

Pennycook, A. (2001). *Critical Applied Linguistics: A Critical Introduction.* Marwah, NJ: Lawrence Erlbaum Assocs.

Perret, G. (2000). Researching second and foreign language development. In L. Unsworth, *Researching Language in Schools and Communities* (pp. 87-110). London: Casell.

Poynton, C. (2000). Linguistics and Discourse Analysis. In A. Lee, & C. Poynton, *Culture and Text: Discourse and Methodology in Social Research and Cultural Studies* (pp. 19-39). Plymouth: Rownand and Littlefield Publishers, Inc.

Richards, K. (2003). *Qualitative Inquiry in TESOL.* Basingstoke: Palgrave Macmillan.

Rose, D., Lui-Chivizhe, L., McKnight, A., & Smith, A. (2003). Scaffolding academic reading and writing at the Koori Centre. *The Australian Journal of Indigenous Education vol.32*, 41-49.

Tannenbaum, A. (1995). *Distributed Operating Systems.* Upper Saddle River: Prentice Hall.

Vernon, D., & Furlong, D. (2007). Philosophical Foundations of AI. In M. Lungarella, F. Lida, J. Bongard, & R. Pfeifer, *50 Years of AI* (pp. 53-62). Berlin: Springer-Verlag.

The Author

Nick Moore holds a Ph.D. in Applied Linguistics (University of Liverpool), an M.Sc. in Teaching English (Aston University) and a DTEFLA. He currently teaches English and Linguistics courses in the U.A.E. His research interests include discourse analysis, corpus linguistics, and curriculum, assessment, lexis and reading in English language teaching.