Diagnosing reading and writing in a second or foreign language

Ari Huhta
University of Jyväskylä

J Charles Alderson
Lancaster University

Japanese Language Testing Association
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Draft Outline

Diagnosis?

Constructs: reading and writing in a second or foreign language (= defining constructs)

DIALUKI studies (= attempts at operationalising constructs)
  ◦ pave way for more better diagnostic tests in the future
Focus on learners’ strengths and weaknesses; on their prediction, even explanation

Very under-developed and under-theorised in language testing and teaching

Diagnosis requires a better understanding of language abilities at a less general level than is currently the case

Need to define constructs both theoretically and operationally.

(see Alderson 2005, 2007; Huhta 2008)
DELNA (Diagnostic English Language Needs Assessment)

“DELNA is in place at The University of Auckland to assess your readiness for study at an English-medium university and to identify any language needs you might have.”

30 minute screening +/- 2 hour “diagnosis” Profile in Listening, Reading and Writing which will guide students to “appropriate language enrichment programme on campus that best suits your particular needs”
see Alderson 2005; Alderson and Huhta 2005; Huhta 2008; Huhta 2010

Designed as diagnosis, used as placement

Test–level adaptive

Levels of diagnosis:
  ◦ CEFR level by skill
  ◦ Vocabulary Size
  ◦ Contrast of self–assessment with test result
  ◦ Explanatory feedback on discrepancies
  ◦ Item–level feedback with label of skill tested
  ◦ Advisory feedback re improvement

Only theoretical basis = CEFR and traditional skills
  • profile = limited diagnostic value; information at a very broad level
Retrofitting as Diagnosis

- Special issue of *Language Assessment Quarterly* 2009 on Cognitive Diagnosis: three psychometric models
  - the general diagnostic model,
  - the fusion model,
  - latent class analysis
- Focus on psychometric models and statistical analysis of TOEFL iBT prototype.
- TOEFL is a proficiency test, not diagnostic
- No theory of diagnosis
- Test not developed to be diagnostic

Huhta & Alderson JLTA 2010
Teaching as Diagnosis

What and how, if at all, do teachers learn about diagnosis?
What exactly do teachers do when giving diagnostic feedback to students?
What diagnosis and feedback proves to be effective – and why?
Can “Assessment for Learning” (AfL) help?
Is “Dynamic Assessment” anything more than good teaching?
Where is the research into these questions?

Huhta & Alderson JLTA 2010
Diagnosis

- Diagnosis common in medicine, car mechanics and first language reading
- Can we learn from these areas?
- Symptoms of illness, not wellness?
- Understanding causes of malfunctioning?
- Developing tests that will identify problems
- Developing suitable, meaningful feedback
- Effective advice on remediation?
One cannot develop sound language tests without a method of defining what it means to know a language, for until you have decided what you are measuring, you cannot claim to have measured it (Spolsky 1989:140).
Defining constructs
– What is reading?

- Huge field, enormous literature – for L1
- Much less for L2, and L2 highly derivative of L1 reading theory.
- Reading is: rapid; efficient; comprehension; interactive; strategic; flexible; purposeful; evaluative; learning; linguistic (Grabe, 2009, Ch 1).
What is reading?

- Low-level processes: must be highly automatised for fluent reading, i.e. cannot stop ourselves recognising words
Rapid and automatic recognition of known words

car

– you cannot decide not to recognise
... but only if the word is known

linja-auto

Inferencing / background knowledge (of e.g. other languages) may of course help but that requires attention and is not automatic
What is reading?

- Rapid and automatic recognition of a large number of words crucial
  - Orthographic processing at the sub-word level
  - Phonological processing
  - Semantic and syntactic processing
  - Lexical access
  - Morphological processing
  - Context effects
Role of working memory

Long-term memory vs working-memory

- Working memory: limited size, limited parallel processing capacity. Once operations automatised, less strain on processing capabilities of working memory.
- The system managing attention = *executive control*.
- Supported by two further systems:
  - *phonological loop*: allows the replaying and recall of subvocalised sounds
  - *visuo–spacial sketchpad*: does the same for images and special relations.
At the **lower-level** of reading comprehension working memory:

- supports phonological, orthographic, and morphological processing
- stores activated words
- combines activated words
- carries out semantic and syntactic processing at clause level
- probably suppresses irrelevant information
- builds semantic idea units.

*Huhta & Alderson JLTA 2010*
Higher-level reading processes

- build models of the text as a whole
- extract meaning at supra-word, supra-clause level.
- key feature of higher-level processes is that attentional resources *can* be applied to them, unlike word recognition (= purely automatic).
  - e.g., can choose in how much detail you want to read a text (a higher order process), but cannot choose whether or not to recognise a known word (a lower order process).
Major components of higher level reading comprehension processes

A) a text model of reader comprehension
B) a situation model of reader interpretation
C) a set of reading skills and resources under the command of the executive control in working memory (strategies, goals, inferences, background knowledge, comprehension monitoring)

Huhta & Alderson JLTA 2010
Models of comprehension and interpretation

- **Text level model of comprehension** = extraction of the meaning the writer is attempting to convey.

- **Situation model of reader interpretation** = synthesis of the reader’s background knowledge with the text model, taking into account the purpose of the reader in reading the text.
Building a text model of reader comprehension

- Linkages into a semantic network.
- Overlap of elements of the networks.
- Suppression of less important information.
- Simple inferencing.
- Restructuring of text into summaries.
Building a situation model of reader interpretation

- Reader purpose
- Task expectation
- Genre activation
- Similar story instances
- General background knowledge resources
- Evaluation of the importance of information
- Attitudes towards writer, story, genre, episode
- Inferences needed for interpretation (of genre, episode, hierarchical organisation, purpose)

Huhta & Alderson JLTA 2010
Cognitive models (Grabe, 2009)

- Construction–Integration
- Structure Building Framework
- Landscape View of Reading
- Capacity Constrained READER
- Interactive Compensatory
- Verbal Efficiency
- Compensatory–Encoding
- Simple View of Reading
- Rauding
- Dual–Coding Theory
- Word–recognition models
- (Psycholinguistic Guessing Game)
Cognitive model of writing (Hayes 1996)
Writing model (upper part)

**TASK ENVIRONMENT**

- Social environment
  - Audience
  - Collaborators
- Physical environment
  - Text so far
  - Composing medium

**INDIVIDUAL**

- MOTIVATION / AFFECT
- COGNITIVE PROCESSES
Writing model (lower part)

INDIVIDUAL

MOTIVATION / AFFECT
- Goals
- Predispositions
- Beliefs & Attitudes
- Cost / benefit analysis

WORKING MEMORY
- Phonological memory
- Visual / Spatial sketchpad
- Semantic memory

LONG-TERM MEMORY
- Task schemas
- Topic knowledge
- Audience knowledge
- Linguistic knowledge
- Genre knowledge

COGNITIVE PROCESSES
- Text interpretation
- Reflection
- Text production
Diagnosing reading and writing in SFL in Finland

- Co-funded by UK Economic and Social Research Council, Academy of Finland and University of Jyväskylä
- attempts at operationalising constructs
- paves way for more better diagnostic tests in the future by increasing our understanding of diagnosing L2 reading and writing
RQ1: Can diagnostic measures of L1 reading and writing predict difficulties in SFL reading and writing?

RQ2: How does SFL proficiency in reading and writing develop in psycholinguistic and linguistic terms?

RQ3: Which features or combinations of features characterise different CEFR proficiency levels?

- Cooperation between language testers, other applied linguists and psychologists (L1 reading)
- Cooperation with TOPLING project (SLA, Maisa Martin)
DIALUKI - Diagnosing reading and writing in a second or foreign language

The Research Project is funded by the Academy of Finland, the University of Jyväskylä and the UK Economic and Social Research Council (ESRC).

Overview
The project studies the diagnosis of reading and writing abilities in a second or foreign language. It seeks to identify the cognitive features which predict a learner’s strengths and weaknesses in those areas. The project brings together scholars from applied linguistics, psychology and assessment to engage in multidisciplinary work and to develop innovative ways of diagnosing the development of second and foreign language abilities.

The main contribution of the project will be to offer novel, well-grounded theoretical insights and to develop a range of methodologies to study second and foreign language development and its diagnosis. We are exploring the causes underlying strengths and weaknesses in language development, and the relationship between literacy skills in one’s first language and the development of second language abilities. The results of the project will also have practical implications by providing a sounder theoretical basis for the development of curricula, pedagogic materials and diagnostic tests.
DIALUKI Informants

- Finnish speaking learners of English as FL at ages 10/11, 14/15 and 17/18
- Russian-speaking learners of Finnish as SL at beginner and intermediate levels
- Cross-sectionally and longitudinally
  - 5 x 200 learners (cross-sectional study)
Three major studies in DIALUKI

Study 1 (in 2010): The value of a range of L1 diagnostic procedures in SFL literacy, in order to select the best predictors for further longitudinal study.

Study 2 (in 2011): The effects on SFL reading and writing of training in reading-related skills by means of a computerized learning game either in Finnish or in English over a 6–10 week period.

- **Graphogame** for diagnosing & treating dyslexia

Study 3 (in 2011 – 2012/13): The development of literacy skills, and the relationship of this development to the diagnostic measures, over a 2–3 year period.
DIALUKI (Study 1) outline

INDEPENDENT VARIABLES

- Cognitive features
- Motivation
- L2 vocabulary size
- Personal and family background
- Self-assessment of L1 & L2 reading & writing

DEPENDENT VARIABLES

- L1 reading
- L1 writing
- L2 reading
- L2 writing
Study 1

Cognitive/psycholinguistic features / constructs, e.g.:

- efficiency of working memory (capacity, speed, ...)
- efficiency of phonological processing (and of phonological loop)
- phonological awareness
- speed of lexical access
- efficiency of syntactic and semantic processing and awareness
Cognitive/psycholinguistic measures (operationalizations), e.g.:
- backwards digit span
- rapid recognition of L1 & L2 words
- repetition of non-words in L1 & L2
- finding common phonemes in L1 non-words
- phoneme deletion task in L1 non-words
- writing heard non-words in L1
- segmentation task
Reading as many words as possible in one minute

<table>
<thead>
<tr>
<th>Osio</th>
<th>Vastaus</th>
<th>P.</th>
<th>Osio</th>
<th>Vastaus</th>
<th>P.</th>
<th>Osio</th>
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<td>1.</td>
<td>eli</td>
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<td>haluttaisiin</td>
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<td>5.</td>
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<td></td>
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<td>kauneimmillaan</td>
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<td>6.</td>
<td>mies</td>
<td></td>
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<td>tyhjennetty</td>
<td></td>
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<td>7.</td>
<td>talo</td>
<td></td>
<td>42.</td>
<td>kyynel</td>
<td></td>
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<td>pyyhkeet</td>
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<td>13.</td>
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<td>48.</td>
<td>kerskailla</td>
<td></td>
<td>83. hiihtourheilu</td>
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<td>14.</td>
<td>kuulo</td>
<td></td>
<td>49.</td>
<td>professori</td>
<td></td>
<td>84. kruunun prinssi</td>
</tr>
</tbody>
</table>
Rapid Automatic Naming (colours + letters + numbers)
Rapid recognition of words

***
Rapid recognition of words

day
Rapid recognition of words

***
Rapid recognition of words

***
# Phoneme deletion

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Correctness of the repetition</th>
<th>Phoneme deleted</th>
<th>Correctness of the deletion</th>
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</thead>
<tbody>
<tr>
<td>1. kaaS</td>
<td>kaa</td>
<td>kaa</td>
<td></td>
</tr>
<tr>
<td>2. Tauk</td>
<td>auk</td>
<td>auk</td>
<td></td>
</tr>
<tr>
<td>3. Hok</td>
<td>ok</td>
<td>ok</td>
<td></td>
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<tr>
<td>etc</td>
<td></td>
<td></td>
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<td>TOTAL CORRECT</td>
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<td>TOTAL CORRECT</td>
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</tbody>
</table>

Huhta & Alderson JLTA 2010
Backward digit span memory test

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<tr>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>2 - 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>5 - 7 - 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>7 - 2 - 9 - 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>4 - 1 - 3 - 5 - 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>1 - 6 - 5 - 2 - 9 - 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>8 - 5 - 9 - 2 - 3 - 4 - 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>6 - 9 - 1 - 6 - 3 - 2 - 5 - 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study 1
Linguistic constructs and their measures

**Receptive** vocabulary (Schmitt et al. Vocabulary Levels test for English; possibly L1 vocabulary tests)
L1 reading (possibly PISA or PIRLS reading tests)
L2 reading (English & Finnish – Pearson General and DIALANG reading tests)
L1 writing (CEFLING/TOPLING writing tasks)
L2 writing (Pearson General and CEFLING/TOPLING tasks)

→ CEFR level in L2 reading and writing
→ raw and IRT–based test scores ; L1 writing level (CEFR?)
I am 70 and consider myself active around the house and garden. I'm up and down the stairs all day long, walk to and from the shops and to visit friends. Do I really need to do exercise on top of all that? My daughter says I do. What's your professional opinion?

Where is the text taken from?
- An advertisement for a sports centre.
- An article about keeping fit.
- A letter to an advice column.
- A report about exercise for old people.
L2 reading tests (Pearson Test of English – General)

Oats are healthy and satisfying. Our nutritious oat biscuits are high in fibre, which keeps you feeling fuller for longer. Oats should be part of every .................. lifestyle, so buy Payne’s natural oat biscuits today!

A  □  healthy

B  □  delicious

C  □  filling
Message to an internet store

Your parents have ordered a PC game for you from a British internet store. When you get the game you notice that it doesn’t work properly. You get upset and decide to write an email message to the internet store. In the message, say

- who you are
- what your parents ordered
- why you’re unhappy (mention at least two defects/problems)
- how you would like them to take care of the matter
- give your contact information

Remember to **begin** and **end** the message appropriately. Write **in English** in clear characters in the space below.
Writing tasks (CEFLING 2)

Opinion

Choose one of the topics and write about what you think about the matter. Give reasons for your opinion.

1. Boys and girls should go to different classes at school.
2. No mobile phones at school!

Write in English in clear characters in the space below.
Motivation and background variables

- Iwaniec Motivation measure
  - Instrumentality, Intrinsic Interest, Motivational Intensity, Parental Encouragement, Anxiety, Self-regulation and Self-concept

- Background variables based on e.g PISA questionnaire
  - Age, gender, attitude to reading, reading habits, parents’ reading habits, family’s SES, dyslexia risk

- Self-assessment questionnaire

- (Think-alouds and interviews)
Thank you for your attention!

Questions, comments, suggestions & exchange of ideas are most welcome

ari.huhta@jyu.fi
c.alderson@lancaster.ac.uk