Comparing Danish and Swedish versions of PISA scientific literacy

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Abstract

This paper presents a comparison between the Swedish, Danish, English, and French versions of three scientific literacy test-units from the released PISA items 2006. More specifically it compares how different words and concepts have been translated in the Swedish and Danish tests, compared to the English and French original versions. Differences that occur as a result of the translation process concerning words’ meaning are demonstrated. The possible consequences of such differences are exemplified by an excerpt from a situation in which Swedish 15-year-old students collaboratively worked with these three PISA units. In the paper we claim that in spite of detailed and strongly controlled methods for achieving translations of high standard used by the PISA, important and perhaps even decisive, differences between the four versions exist.

1. Introduction

The stressed importance of international comparisons as support for educational reforms (Broadfoot & Black, 2004), calls for high validity of international large-scale assessments. In the case of PISA, the aim is to assess students’ knowledge in situations of general life and not only on school related issues (OECD, 2006, p. 7). Research has critically targeted the challenge of comparing knowledge and skills of the young population in a globalized world with yet tremendously different learning environments (Dolin & Krogh, 2008; Sjøberg, 2007).

In PISA, the strongly controlled translation procedure is claimed to be of a very high standard (OECD, 2006). Test materials are created in both French and English followed by a “double translation” and “reconciliation process” assumed to guarantee the quality of test-items (Bybee et al., 2009, p. 874). Several studies have pointed at still existing translation-related problems in PISA (Arffman, 2010; Puchhammer, 2007). Puchhammer (2007) demonstrated for German and English PISA 2003 mathematics items an increased reading-load in the German version and that frequent English words very often were replaced by infrequent German words (Puchhammer, 2007, p. 134). On a comparative study of Finnish and English reading literacy items Arffman (2010) suggested six categories of translation problematic in PISA, including translators’ editing and improving of items, writing errors, mistranslations of metaphors, differences in grammar and in how formal the texts were. Concerning scientific literacy, Sjøberg (2007) has stressed that several items in the PISA test differ between the English and Norwegian versions.

We propose the problematic of translation differences be considered in the light of research in science education that stress the importance of discursive knowledge, as well for the learning of science as for its assessment (cf. Schoultz, 2000). More specifically, the insights about how words connote differently in different discursive practices, which have led to arguing that students’ test results depend on the very structure of test-questions (ibid), could be used for
understanding how the translation between national languages change the premises for assessment.

The results presented here stem from an empirical study with the objective to study how Swedish 15-year-olds made meaning of written PISA science test-questions. The results encouraged the first author and her Danish research companion to engage in differences and similarities between the national versions of PISA. The aim here is to point at translation differences between national versions, and to discuss what can be problematic about this.

2. Method

2.1. Setting
The empirical data consist of a) 16 hours of video-taped material of student collaborative work and b) the Swedish, Danish, English and French versions of three selected test-units (S114, S447, S485) from the released scientific literacy-items of PISA\(^1\). The selection of items (11 in total) was made using criteria of student relevance and long-term use in PISA (see Serder & Jakobsson, 2014). 21 small groups of Swedish 15-year-old students worked during one science lesson with the test-units with the instruction to negotiate and agree on one common written answer for each question. The research comprised observing, transcribing and semantically analysing (Mäkitalo, Jakobsson, & Säljö, 2009) the meaning-making of the students (ibid). During the process of analysis, problems emerged which could be related to the “transformation” that the test-questions had been exposed to when translated from the original French and English PISA-versions, and this encouraged us to a second and third step of analysis.

2.2. Analysis
1) The semantic analysis of the students’ discussions followed Mäkitalo, Jakobsson and Säljö (2009), with a focus on gaps in student interaction (ibid). In this analysis, the concern was to discern how the meaning of the test-items appeared in the students’ discussions (see Serder & Jakobsson, 2014).
2) In the preceding comparative item-analysis we focused the words that appeared as gaps in step 1. The Swedish version of the test-items was compared to the Danish version, analyzing similarities and differences.
3) In the third step, the Swedish and Danish versions were compared to the English and the French. The concern was to identify words with possible different connotations in the four test versions.

3. Results

3.1. Comparison between Swedish, Danish, English and French versions of S447

Due to restrictions in space, the paper reports only examples from one of the units, S447. For S485 and S114 several word translations that differ in their respective connotations were also found.

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<th>English</th>
<th>Swedish</th>
<th>Danish</th>
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<tr>
<td>S447</td>
<td>SPF</td>
<td>solskyddsfaktor</td>
<td>solecremer</td>
<td>écrans solaires</td>
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For instance the Swedish/Englishs word "mönster"/"pattern" correspond in Danish/French to "resultater"/ "résultats"; words with different connotations in different discursive practices (Mäkitalo, Jakobsson & Säljö, 2009). The same goes for "factor", "better" and "diagram".

3.2 Students’ meaning-making of the word “bättre”.

What are the possible consequences of the use of a specific term, with somewhat different meaning in Swedish and Danish? One excerpt (of many possible) is presented here showing two students who discuss a multiple-choice test-item (Q03S447; Sunscreens) concerning a fictive experiment on sun creams and the question is what is being investigated (see Appendix 1). One of the options in English goes: “Is there any sunscreen that gives better protection than zinc oxide?” whereas “better protection” in Swedish is replaced with “mer skydd” (“more protection”).

1. **Linus**: men alltså hur = är ju alltså vilken skyddar bäst? alltså hur den skyddar
2. **Malin**: ja ja
3. **Linus**: Men det är nog zinkoxid = stänger ute det mesta ju = ute nästan allt solljus = och det är ju inte bra för kroppen = och ha = eller för zink = är ju inte bra överhuvudtaget = för vissa är ju allergiska mot zink och så = så det är ju inte bra ju = alltså metaller och sånt ju = men jag tror det är vilket av solskyddsmedel som ger bättre skydd än zinkoxid? [alternativ D] så är närmare jag tror det är ”D” skulle jag nästan säg

In Swedish language use both ways of saying this – “more than” (mer än) and “better than” (bättre än) - are acceptable and possible. “More protection” is reasonably also corresponding to “better protection”. Yet, the word “better” has other aesthetic or value-laden connotations. In the dialogue above, this specific connotation is surfaced: *better* is used for denoting higher value, in the sense “healthier”.

4. Discussion

The results of this comparison point at the difficulties, which despite strongly controlled translation processes, come with translations of international tests in science literacy. The results suggest that translation guidelines can be differently interpreted, either to accomplish the most comprehensive translation into the national language at issue (as we see in the Danish version), or to achieve the most identical version compared to the original French and English
versions (as the Swedish). The number of “different translation”-occurrences found in these three PISA units are problematic, especially if taking into account that students might use them with new meanings. The comparisons also highlight the importance of giving enough of time for the translation processes in international studies.

5. References


