8. The Interfaces at L2 Ultimate Attainment: Lexicon

Introduction

This chapter completes the series of experiments on the interfaces at L2 ultimate attainment by testing the interaction of syntax and the lexicon, i.e. argument structure. So far, the experiments on the syntax-morphology interface (Chapter 6) and the syntax-information structure interface (Chapter 7) have shown that convergence on the TL is possible at near-native levels even for (native English) L2ers whose L1 does not realize the same properties as the TL. Moreover, the preceding chapters identified two factors affecting non-convergence: First, computational problems of morphological checking at the syntax-morphology interface, and, second, L1 transfer of information structure for the L1 Dutch group. Against this background, the final experiment explores whether the near-natives converge also on argument structure and whether problems with inflectional morphology and L1 transfer equally affect the mapping between the lexicon and syntax.

The final experiment in this thesis considers the interaction of syntactic reanalysis and argument structure in speeded judgements. It investigates whether dative-experiencer verbs whose thematic properties lead to an OS base order show different reanalysis patterns compared to derived OS orders. The results show L1 effects of convergence in that the L1 Russian groups and the L1 Dutch near-natives display target patterns. I argue that the pattern of non-convergence of the L1 English groups and the L1 Dutch advanced group points to difficulties with case marking affecting the mapping between the lexicon and syntax.

The chapter is structured as follows: Section 8.1 recaps the relevant background on scrambling and argument structure and presents an overview of the research questions. Section 8.2 lists information about the participants in Experiment 7. The materials of Experiment 7 are given in Sections 8.3 to 8.6. Section 8.7 presents the results of a pretest on dative case that establishes whether L2ers have knowledge of lexical case marking. Subsequently, Sections 8.8 to 8.12 give the results of the speeded grammaticality judgement task, and Section 8.13 discusses its results.

8.1. Overview and research questions

Previous research on the syntax-lexicon interface at L2 ultimate attainment reports L1 effects on (non-)convergence. Sorace (1993, see Chapter 1.3.6.3) shows that L1 French, yet not L1 English, near-natives converge on unaccusativity distinctions in Italian, as expressed in morphological realization of auxiliaries (essere, ‘be’ versus avere, ‘have’). These findings echo L1 effects in lower-level L2 learners, especially where the
morphological marking of argument structure distinctions varies between L1 and the TL (for overview, see Montrul, 2005; White, 2003b).

In German, syntactic reordering interacts with argument structure in that the thematic grid of the verb determines the base order of arguments in syntax (e.g. Grimshaw, 1990) and thus determines whether an OS order is (a) basic or (b) derived by scrambling. For canonical transitive verbs, the argument hierarchy maps onto a syntactic structure in which the Agent outranks the Patient, etc., i.e. an SO order. By contrast, dative experiencer verbs, a subclass of unaccusative verbs, bear a Theme-Experiencer thematic structure which maps onto a base OS order (see Chapter 3.5 and, e.g., Fanselow, 2000; Wunderlich, 1997). For a verb like gefallen (‘please/be appealing to’), the OS order is thus taken to be the unmarked linearization (1b).

(1) a. … dass [der Vater]_i dem Onkel t_i gefällt. (German)
   … that the father_NOM the uncle_DAT pleases
   ‘… that the father is pleasing to the uncle.’
   b. … dass dem Onkel der Vater gefällt.

By contrast, dative active verbs like helfen (‘help’), gratulieren (‘congratulate’), etc. project to an SO order, so that the OS order is derived by movement, which is illustrated in (2).

(2) a. … dass der Vater dem Onkel gratuliert. (German)
   that the father/NOM the uncle_DAT congratulates
   b. … dass [dem Onkel]_i der Vater t_i gratuliert

In native processing, non-derived OS orders with dative experiencers have been found to show no processing disadvantage or even a processing advantage compared to SO counterparts (see Chapter 4.2.2. and, e.g., Bornkessel et al., 2003b). However, derived OS orders with dative active verbs do show signatures of syntactic reanalysis (Schlesewsky & Bornkessel, 2003). These findings indicate that thematic information determining syntactic hierarchies is used by the parser in the construction of phrase structure. Experiment 7 investigates whether advanced to near-native L2 speakers of German show analogous interactions of argument structure and syntactic reanalysis in speeded judgements. Experiment 7 aims to elicit the following target pattern (P.7).

(P.7) Target pattern for Experiment 7
Due to the base OS order projected by dative experiencer verbs, non-derived OS orders with dative-experiencer verbs do not show reanalysis effects compared to derived OS orders in the context of accusative-active or dative-active verbs.
Accordingly, the research questions for the non-native groups are:

(Q7.1) Do L2ers make a difference in judgement accuracy or reaction times relative to argument structure, i.e. between dative-active and dative-experiencer objects?
(Q7.2) Are there L1 or proficiency effects?

Table 8.1. lists the cross-linguistic differences relevant for Experiment 7.

<table>
<thead>
<tr>
<th>Syntax of scrambling</th>
<th>Target</th>
<th>L1s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GERMAN</td>
<td>ENGLISH</td>
</tr>
<tr>
<td>Short scrambling</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Medium scrambling</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Syntax-Morphology (Case)</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Syntax-Argument Structure (Dative Experiencers)</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 8.1. Cross-linguistic differences in scrambling relevant in the context of Experiment 7.

In terms of L1 properties, both Russian and Dutch have dative experiencer verbs projecting to a base OS order (see Chapter 3.5). For instance, like its German translation equivalent gefallen, the Dutch verb bevallen (‘please’) projects a non-derived OS order due to its thematic properties. If L1 transfer of argument structure mediates convergence on argument structure distinctions in the L2, the L1 Russian and L1 Dutch groups are thus expected to outperform the L1 English group. If, in addition, L1-TL correspondences in argument-structure changing morphology affect (non-)convergence, further differences are expected between the L1 Russian group and the L1 Dutch group, since Russian has overt dative case marking but Dutch does not.

8.2. Participants

The experiment was conducted with the 20 L1 English, 21 L1 Dutch and 22 L1 Russian learners that also participated in Experiment 6 reported in Chapter 7. As described in Chapter 7, these subjects were allocated to two proficiency groups, advanced and near-native, on the basis of a C-test. For convenience, Table 8.2 (repeated from Chapter 7) charts the participant characteristics.
Table 8.2. Participant information by group.

8.3. Materials

The materials encompassed verbs that differed in argument structure type (active versus experiencer) and case (accusative versus dative). Since there are no accusative experiencer verbs projecting a base OS order, the design of the experiment cannot be fully factorial. In consequence, four sets of 12 sentences each were created in a 3x2x2 design. Sentences differed according to the factor Type (accusative-active, dative-active, dative-experiencer). Sentences within each dodecuplet were either in SO or OS order (Factor Order). Further, sentences were disambiguated either by case marking on NPs or by number marking on the verb (Factor Ambiguity). Two additional versions within each set of 12 was constructed by reversing the position of the nouns (i.e. N1-N2 and N2-N1), so that any potential effect of lexical semantics or pragmatics of the SO and OS manipulation would be completely matched. This reversal was not included as a factor in the statistical design.

The speeded grammaticality judgement task thus included the 12 following conditions: For disambiguation by case marking, the experiment encompassed (a) accusative SO (3) and OS (4) orders, (b) dative-active SO (5) and OS (6) orders and (c) dative-experiencer SO (7) and OS (8) orders. For disambiguation by verbal agreement, the experiment contained (d) accusative SO (9) and OS (10) orders, (e) dative-active SO (11) and OS (12) orders and (f) dative-experiencer SO (13) and OS (14) orders. The NPs in sentences disambiguated by case ((3)-(8)) carried unambiguous case information,
while the NPs in sentences disambiguated by verbal agreement ((9)-(14)) were three-way ambiguous between nominative, accusative and dative case. In the unambiguous conditions, all NPs were masculine singular definites. In the ambiguous conditions, one NP was a singular proper name and the other NP was a bare plural NP; in this latter condition, both NPs were three-way ambiguous between nominative, accusative and dative case.

(3) Er glaubt, dass der Vater am Freitag den Onkel gegrüßt hat. (SO)
He thinks that the NOM father on Friday the ACC uncle greeted has

(4) Er glaubt, dass den Onkel am Freitag der Vater gegrüßt hat. (OS)
He thinks that the ACC uncle on Friday the NOM father greeted has

(5) Er glaubt, dass der Vater am Sonntag dem Onkel zugestimmt hat. (SO)
He thinks that the NOM father on Sunday the uncle DAT agreed-to has

(6) Er glaubt, dass dem Onkel am Sonntag der Vater zugestimmt hat. (OS)
He thinks that the ACC uncle on Sunday the NOM father agreed-to has

(7) Er glaubt, dass der Vater am Sonntag dem Onkel gefehlt hat. (SO)
He thinks that the NOM father on Sunday the uncle DAT be-lacking-to has

(8) Er glaubt, dass dem Onkel am Sonntag der Vater gefehlt hat. (OS)
He thinks that the ACC uncle on Sunday the NOM father be-lacking-to has

(9) Er glaubt, dass Athleten am Montag Karin gesehen haben. (SO)
He thinks that the plural athletes on Monday Karin seen have

(10) Er glaubt, dass Athleten am Montag Karin gesehen hat. (OS)
He thinks that the plural athletes on Monday Karin seen has

(11) Er glaubt, dass Athleten am Montag Karin applaudiert haben. (SO)
He thinks that the plural athletes on Monday Karin applauded have

(12) Er glaubt, dass Athleten am Montag Karin applaudiert hat. (OS)
He thinks that the plural athletes on Monday Karin applauded has

(13) Er glaubt, dass Athleten am Montag Karin gefallen haben. (SO)
He thinks that the plural athletes on Monday Karin pleased have

(14) Er glaubt, dass Athleten am Montag Karin gefallen hat. (OS)
He thinks that the plural athletes on Monday Karin pleased has
Each condition comprised 6 sentences. Each noun and each verb appeared only once, so that participants encountered each lexicalization only once. An exception to this were the dative experiencer verbs. Since these are a small class of verbs in German, only 6 different verbs were used that were spread equally across the four conditions, with each verb appearing once in each dative experiencer condition. The dative-experiencer verbs were *gefallen* (‘please/be appealing to’), *missfallen* (‘be displeasing to’), *auffallen* (‘be noticeable to’), *schaden* (‘harm’), *nützen* (‘be useful to’) and *fehlen* (‘be missing to’). There were four lists which counterbalanced order and case of the NPs (in the unambiguous condition) and order and verbal number marking (in the ambiguous condition), respectively. The lists were created according to the results of the plausibility testing, discussed next.

### 8.4. Plausibility and reversibility

The plausibility and reversibility of items was tested in a separate off-line study that was equivalent in design to the plausibility study for Experiments 2 and 3 (Chapter 6). It was administered to 36 native speakers of German in a web-based untimed rating study. Seventy-two potential experimental items (8 of each experimental item) were tested in two 50-item rating tasks; two versions each were created to reduce the length of each list. Two lists were created by reversing the order. Each list was rated by 8 to 11 participants who were randomly assigned to lists. Items were matched and selected according to the criteria described in the context of Experiments 2 and 3 in Chapter 6.

### 8.5. Fillers

In addition to the experimental items, the task included 30 fillers, thus yielding a total of 102 items. The fillers were the same for each list and encompassed various constructions. In order to prevent the subjects from developing response strategies based on surface generalizations about case and verbal agreement marking, the fillers contained ungrammatical double-nominative, double-accusative and double-dative violations as in Experiment 3. In addition, the fillers contained ungrammatical number violations. The remaining fillers were of various other structures.
8.6. Assignment to groups and lists, procedure and order of presentation

Items were assigned to lists according to a Latin Square design, exemplified in the context of Experiment 2 in Chapter 6. Presentation order was randomized. Following similar speeded judgement tasks on native speakers (Meng & Bader, 2000; Schlesewsky, Fanselow et al., 2003), the rate of presentation was 250 ms per word plus 17 ms per letter. There was no inter-stimulus interval. Sentences were presented without punctuation. After the final word of each sentence, participants made an immediate binary grammaticality judgement. Participants’ responses and response times following the offset of the final word in the sentence were recorded. The full details of the experimental procedure are given in the context of Experiment 3 (Chapter 6).

8.7. Pretest on dative case

In order to establish whether the non-natives (a) have knowledge of the verbs that take dative-marked objects used in Experiment 7 and (b) have knowledge of the dative case paradigm, an off-line pretest was administered. The pretest, a fill-in-the-gaps task, comprised four texts in which all definite articles were blanked out, so that each text contained between 18 and 23 gaps that had to be filled in. The texts were designed to contain all 32 dative verbs (26 dative active, 6 dative experiencer verbs) used in the experiment. Each of these verbs occurred once in the pretest. Although it would have been preferable to test each verb more than once, length restrictions prohibited the repetition of the full set of dative verbs. In total, the pretest contained 18 omitted nominative articles, 19 omitted accusative articles, 34 omitted dative articles and 12 omitted genitive articles (see Appendix J). The test was administered via the Internet where participants could log on to the experimental website; subjects were maximally allowed 2.5 minutes for working on each text. The test was run after Experiment 7 for most participants to avoid potential interference of this off-line task on the speeded acceptability judgements. A composite accuracy score was calculated and displayed to the participants immediately after completion of the test. The score displayed to the participants was not limited to dative case; rather, it encompassed all case types. Overall, the non-native participants scored between 33% and 100%; native speaker controls achieved between 88% and 100% (see Table 8.3). Table 8.3 illustrates differences in off-line accuracy on case marking between the advanced and near-native groups. In addition, the pretest results replicate the differences between L1 groups in the analyses of the elicited production task (Chapter 7): The L1 Russian groups show consistently higher accuracy on case marking in L2 German than their L1 English or L1 Dutch counterparts.
Table 8.3. Overall accuracy on pretest on case.

Table 8.4 presents a breakdown of accuracy in definite determiner supplicance according to case type.

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced (n=8)</th>
<th>ENGLISH Near-Native (n=9)</th>
<th>DUTCH Advanced (n=11)</th>
<th>DUTCH Near-Native (n=9)</th>
<th>RUSSIAN Advanced (n=12)</th>
<th>RUSSIAN Near-Native (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>58%-89%</td>
<td>71%-95%</td>
<td>33%-87%</td>
<td>71%-95%</td>
<td>78%-93%</td>
<td>78%-100%</td>
</tr>
<tr>
<td><strong>Average Score</strong></td>
<td>71%</td>
<td>85%</td>
<td>63%</td>
<td>85%</td>
<td>86%</td>
<td>93%</td>
</tr>
</tbody>
</table>

**Table 8.3.** Overall accuracy on pretest on case.

**Table 8.4.** Case errors by type in pretest.

Given the rationale of Experiment 7, the category of dative case was further subdivided into dative-active and dative-experiencer verbs. Note, however, that the high degree of
syncretism in the German case paradigm (see Chapter 3) precludes the identification of ‘pure’ case errors, such that the errors listed in Table 8.4 are an amalgam of case and gender errors.

Table 8.4. illustrates that case errors are not evenly distributed across case types. Dative case poses the greatest difficulty for all groups; as for argument structure distinctions, however, there are no systematic differences between dative-active verbs and dative experiencers across groups. L1 differences arise in that the L1 Russian group shows the highest accuracy of target-like case marking. In fact, the L1 Russian advanced group patterns with the near-native groups of the other L1 groups. By contrast, the L1 Dutch advanced group demonstrates below 50% accuracy on dative case. The results of the pretest on dative case were used for the main experiment in that the data from the speeded judgement task were analysed separately (a) for all verbs and (b) for dative verbs correctly associated with dative case in the pretest.

8.8. Analysis and results of the speeded grammaticality judgement task

For the speeded grammaticality judgement task, response times of a participant for a sentence above or below two standard deviations of the group mean for that sentence were trimmed to the group mean of the sentence plus or minus two standard deviations, respectively. This affected less than 2% of the trials in each group.

The results were analysed (a) for all responses and (b) for the selection of verbs that a non-native participant had correctly associated with dative case in the pretest. Further, sentences disambiguated by case and sentences disambiguated by verbal agreement were analysed separately.

As there are no accusative experiencer verbs projecting a base OS order, the statistical analysis cannot be fully factorial with respect to case (accusative versus dative) and argument structure. Hence, two separate statistical analyses were carried out in all subsequent analyses: (a) an analysis for case distinctions and (b) an analysis for argument structure distinctions.

(a) In order to find case distinctions, Repeated Measures ANOVAs with the factors Order (SO, OS) or Case (accusative-active, dative-active) as within-subjects factors and Language (German, English, Dutch, Russian) and Proficiency (native, advanced L2 and near-native L2) as between-subjects factors were performed on accuracy scores and on reaction times.

(b) In order to find argument structure distinctions, Repeated Measures ANOVAs with the factors Order (SO, OS) and Argument Structure (dative-active, dative-experiencer) as within-subjects factors and Language (German, English, Dutch, Russian) and Proficiency (native, advanced L2 and near-native L2) as between-subjects factors were performed on accuracy scores and on reaction times.
In subsequent pairwise comparisons, the significance level was set according to the Bonferroni adjustment at an alpha level of .025. Analyses of the reaction times were run separately on all items and on only those items that had been judged correctly. Differences between these analyses, if any, will be noted in the text.

### 8.9. Accuracy: Sentences disambiguated by case

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced (n=9)</th>
<th>ENGLISH Near-Native (n=8)</th>
<th>DUTCH Advanced (n=11)</th>
<th>DUTCH Near-Native (n=10)</th>
<th>RUSSIAN Advanced (n=12)</th>
<th>RUSSIAN Near-Native (n=10)</th>
<th>GERMAN (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3) ACC SO</td>
<td>52/54 (96%)</td>
<td>44/48 (92%)</td>
<td>58/66 (88%)</td>
<td>56/60 (93%)</td>
<td>70/72 (97%)</td>
<td>55/60 (92%)</td>
<td>113/126 (90%)</td>
</tr>
<tr>
<td></td>
<td>1057ms</td>
<td>792ms</td>
<td>907ms</td>
<td>830ms</td>
<td>751ms</td>
<td>894ms</td>
<td>625ms</td>
</tr>
<tr>
<td>(4) ACC OS</td>
<td>43/54 (80%)</td>
<td>39/48 (81%)</td>
<td>47/66 (71%)</td>
<td>36/60 (60%)</td>
<td>60/72 (83%)</td>
<td>57/60 (95%)</td>
<td>99/126 (79%)</td>
</tr>
<tr>
<td></td>
<td>1447ms</td>
<td>1013ms</td>
<td>960ms</td>
<td>1052ms</td>
<td>956ms</td>
<td>900ms</td>
<td>782ms</td>
</tr>
<tr>
<td>(5) DAT active SO</td>
<td>45/54 (83%)</td>
<td>46/48 (96%)</td>
<td>56/66 (85%)</td>
<td>51/60 (85%)</td>
<td>67/72 (93%)</td>
<td>55/60 (92%)</td>
<td>113/126 (90%)</td>
</tr>
<tr>
<td></td>
<td>1270ms</td>
<td>1025ms</td>
<td>938ms</td>
<td>869ms</td>
<td>731ms</td>
<td>913ms</td>
<td>568ms</td>
</tr>
<tr>
<td>(6) DAT active OS</td>
<td>43/54 (80%)</td>
<td>44/48 (92%)</td>
<td>48/66 (72%)</td>
<td>44/60 (73%)</td>
<td>55/72 (76%)</td>
<td>52/60 (87%)</td>
<td>121/126 (96%)</td>
</tr>
<tr>
<td></td>
<td>1240ms</td>
<td>987ms</td>
<td>958ms</td>
<td>1003ms</td>
<td>1021ms</td>
<td>969ms</td>
<td>653ms</td>
</tr>
<tr>
<td>(7) DAT Experiencer SO</td>
<td>47/54 (87%)</td>
<td>42/48 (88%)</td>
<td>41/66 (62%)</td>
<td>48/60 (80%)</td>
<td>65/72 (90%)</td>
<td>51/60 (85%)</td>
<td>110/126 (87%)</td>
</tr>
<tr>
<td></td>
<td>1166ms</td>
<td>1260ms</td>
<td>967ms</td>
<td>1031ms</td>
<td>918ms</td>
<td>1033ms</td>
<td>647ms</td>
</tr>
<tr>
<td>(8) DAT Experiencer OS</td>
<td>40/54 (74%)</td>
<td>35/48 (73%)</td>
<td>44/66 (67%)</td>
<td>41/60 (68%)</td>
<td>57/72 (79%)</td>
<td>48/60 (80%)</td>
<td>106/126 (84%)</td>
</tr>
<tr>
<td></td>
<td>1321ms</td>
<td>1173ms</td>
<td>950ms</td>
<td>912ms</td>
<td>903ms</td>
<td>902ms</td>
<td>660ms</td>
</tr>
</tbody>
</table>

**Table 8.5.** Experiment 7: Disambiguation by Case. Accuracy (in percent) and Reaction Times.
Table 8.5 displays the number (percent) of all accurate responses per condition for the sentences disambiguated by case. Mean reaction times (RT) for all responses are also given.

Table 8.6 only includes dative verbs for which the target case marking was supplied in the pretest. Since the native controls did not take the pretest but can be assumed to know the case marking associated with dative verbs, their results are repeated from Table 8.5. Mean reaction times (RT) for all responses are also given.

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced (n=9)</th>
<th>ENGLISH Near-Native (n=8)</th>
<th>DUTCH Advanced (n=11)</th>
<th>DUTCH Near-Native (n=10)</th>
<th>RUSSIAN Advanced (n=12)</th>
<th>RUSSIAN Near-Native (n=10)</th>
<th>GERMAN (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5) DAT active SO</td>
<td>27/34 (79%)</td>
<td>35/36 (97%)</td>
<td>20/25 (80%)</td>
<td>37/42 (88%)</td>
<td>57/58 (98%)</td>
<td>47/51 (92%)</td>
<td>113/126 (90%)</td>
</tr>
<tr>
<td></td>
<td>1314ms</td>
<td>1047ms</td>
<td>1125ms</td>
<td>906ms</td>
<td>725ms</td>
<td>899ms</td>
<td>568ms</td>
</tr>
<tr>
<td>(6) DAT active OS</td>
<td>24/29 (83%)</td>
<td>27/30 (90%)</td>
<td>22/28 (79%)</td>
<td>35/49 (71%)</td>
<td>41/54 (76%)</td>
<td>50/55 (91%)</td>
<td>121/126 (96%)</td>
</tr>
<tr>
<td></td>
<td>1314ms</td>
<td>803ms</td>
<td>1010ms</td>
<td>1087ms</td>
<td>1007ms</td>
<td>935ms</td>
<td>653ms</td>
</tr>
<tr>
<td>(7) DAT Experiencer SO</td>
<td>27/28 (96%)</td>
<td>31/35 (89%)</td>
<td>10/15 (67%)</td>
<td>32/38 (84%)</td>
<td>46/51 (90%)</td>
<td>46/52 (89%)</td>
<td>110/126 (87%)</td>
</tr>
<tr>
<td></td>
<td>1141ms</td>
<td>1327ms</td>
<td>1283ms</td>
<td>1125ms</td>
<td>875ms</td>
<td>1008ms</td>
<td>647ms</td>
</tr>
<tr>
<td>(8) DAT Experiencer OS</td>
<td>23/27 (85%)</td>
<td>26/35 (74%)</td>
<td>7/14 (50%)</td>
<td>28/38 (74%)</td>
<td>43/50 (86%)</td>
<td>42/51 (82%)</td>
<td>106/126 (84%)</td>
</tr>
<tr>
<td></td>
<td>1338ms</td>
<td>1251ms</td>
<td>1292ms</td>
<td>955ms</td>
<td>894ms</td>
<td>854ms</td>
<td>660ms</td>
</tr>
</tbody>
</table>

Table 8.6. Experiment 7: Disambiguation by Case. Accuracy (in percent) and Reaction Times in Speeded Grammaticality Judgement Task. Correctly judged items only.

(a) For case distinctions, the Repeated Measures ANOVA yields a main effect of Order (F(1,74) 92332, p<0.001), yet no main effect of Case (F(1,74) 0.405, p=0.527). However, there is an interaction of Order and Case (F(1,74) 11.147, p<0.001), indicating differences between accusative and dative verbs by order. There is also a three-way interaction of Order, Case and Language (F(2,74) 3.704, p=0.029) which shows that not all L1 groups show similar distinctions between accusative and dative case.
(b) For argument structure distinctions, the Repeated Measures ANOVA yields main effects of Order (F(1,74) 12.306, p=0.001) and Argument Structure (F(2,74) 14.617, p<0.001). In addition, a marginal three-way interaction of Argument Structure with the factors Language and Proficiency obtains (F(2,74) 2.471, p=0.091).

The interactions in the ANOVAs with the factors Language and Proficiency indicate differences according to these factors. Hence, separate pairwise comparisons were performed for each language and proficiency group. Since the results between all items (Table 8.5) and those items that were correctly associated with dative case in the pretest (Table 8.6) do not vary, pairwise comparisons were calculated for all items, independently of accuracy in the pretest on dative.

**Natives**

In pairwise comparisons, the natives demonstrate a robust difference in accuracy between SO and OS orders for accusative-active verbs (F(1,20) 2.970, p=0.008; F(2,11) 2.527, p=0.028). However, for dative-active (F(1,20) -1.630, p=0.119; F(2,11) 1.268, p=0.231) or dative-experiencer verbs (F(1,20) 1.000, p=0.329; F(2,5) -0.434, p=0.682), there is no analogous difference. For dative verbs, no differences in judgement accuracy arise for the different orderings, irrespective of whether they manifest a base SO order (dative-active) or a base OS order (dative-experiencer).

![Figure 8.1. Experiment 7: Subtraction (SO-OS) of accuracy scores (in %). Natives.](image)

In judgement accuracy, then, the natives make a case distinction, yet not a distinction according to argument structure for dative verbs.
**L1 English**

The L1 English advanced group attests a marginally significant difference between SO and OS orders for accusative-active verbs ($F_{1}(1,8) = 2.449$, $p=0.040$; $F_{2}(1,11) = 2.474$, $p=0.031$) and for dative-experiencers ($F_{1}(1,8) = 2.800$, $p=0.023$; $F_{2}(1,5) = 1.877$, $p=0.119$), yet not for dative-active verbs ($F_{1}(1,8) = 0.800$, $p=0.447$; $F_{2}(1,11) = 0.395$, $p=0.700$). This means that the advanced L1 English group makes neither a target-like case distinction, nor a target-like argument structure distinction.

The lack of a significant effect for dative experiencers might appear surprising given the nominal difference in judgement accuracy in Figure 8.2. Closer inspection of the data reveals that the difference in judgement accuracy between SO and OS for dative experiencers is due to two participants only. For the other six, there is no difference between SO and OS, such that, overall, the difference does not become significant. It is not clear why two participants behave differently, particularly since they pattern along with the other participants in all other conditions.

**Figure 8.2.** Experiment 7: Subtraction (SO minus OS) of accuracy scores (in %). L1 English advanced group and L1 English near-native group.

The L1 English near-natives demonstrate a marginally significant difference between the SO and OS orders for accusative-active verbs ($F_{1}(1,7) = 2.376$, $p=0.049$; $F_{2}(1,11) = 1.428$, $p=0.181$), at least in the analysis by subjects; for dative verbs, neither active ($F_{1}(1,7) = 1.000$, $p=0.351$; $F_{2}(1,11) = 1.117$, $p=0.288$) nor the dative experiencer verbs $F_{1}(1,7) = 1.433$, $p=0.195$; $F_{2}(1,5) = 1.941$, $p=0.110$) show a statistically significant difference between SO and OS orders.\(^1\) Hence, statistically, the L1 English near-natives can be interpreted as possibly making a target-like case distinction, and no argument structure distinction. This statistical pattern is in line with that of the native group.

\(^1\) The lack of a significant effect for dative experiencers might appear surprising given the nominal difference in judgement accuracy in Figure 8.2. Closer inspection of the data reveals that the difference in judgement accuracy between SO and OS for dative experiencers is due to two participants only. For the other six, there is no difference between SO and OS, such that, overall, the difference does not become significant. It is not clear why two participants behave differently, particularly since they pattern along with the other participants in all other conditions.
The L1 Dutch advanced group shows no significant difference between SO and OS orders in the accusative-active condition in the analysis by subjects ($F_1(1,10) = 1.581, p=0.145$; $F_2(1,11) = 3.734, p=0.003$) or in the dative-experiencer condition ($F_1(1,10) = -0.820, p=0.432$; $F_2(1,5) = -0.463, p=0.663$). Yet, the difference is significant for dative-active verbs ($F_1(1,10) = 2.667, p=0.010$; $F_2(1,11) = 3.217, p=0.008$). This pattern does not amount to a target case or an argument structure distinction.

![Figure 8.3. Experiment 7: Subtraction (SO minus OS) of accuracy scores (in %). L1 Dutch advanced group and L1 Dutch near-native group.](image)

The L1 Dutch near-natives show significant differences only for accusative-active verbs ($F_1(1,9) = 3.162, p=0.012$; $F_2(1,11) = 8.508, p<0.001$). There are no significant differences for dative-active ($F_1(1,9) = 1.049, p=0.322$; $F_2(1,11) = 1.541, p=0.152$) or dative-experiencer ($F_1(1,9) = 1.172, p=0.145$; $F_2(1,5) = 3.225, p=0.023$) verbs. In all, then, the L1 Dutch near-natives make a target-like case distinction in judgement accuracy.

**L1 Russian**

The L1 Russian advanced group manifests marginally significant differences between SO and OS orders for accusative-active verbs ($F_1(1,11) = 2.419, p=0.034$; $F_2(1,11) = 4.148, p=0.002$) and dative-experiencer verbs ($F_1(1,11) = 2.345, p=0.039$; $F_2(1,5) = 2.948, p=0.032$), yet not for dative-active verbs in the analysis by subjects ($F_1(1,11) = 1.773, p=0.104$; $F_2(1,11) = 3.416, p=0.006$). In contrast, the L1 Russian near-natives do not show significant differences between SO and OS orders in any condition, since they perform equally well on either order in all conditions.
In sum, native judgement patterns show a case distinctions between accusative and dative. Of the L2 groups, only the L1 English near-natives and the L1 Dutch near-natives show identical patterns, whereas the L1 Russian near-natives perform at near-equal high accuracy across conditions. I consider the reaction times next.

8.10. Reaction times: Sentences disambiguated by case

(a) For case distinctions, the Repeated Measures ANOVA evinces a main effect of Order (F(1,74) 48.508, p<0.001), yet no main effect of Case (F(1,74) 0.001, p=0.997). However, there is an interaction of Order and Case (F(1,74) 6.037, p=0.016). Further, an interaction of the factor Order with Language and Proficiency obtains (F(2,74) 6.754, p=0.002). In addition, an interaction of the factors Order and Case with the factor Language arises (F(2,74) 6.639, p=0.002). These interactions signify that there are between-group differences in response times according to case marking.

(b) For argument structure distinctions, the Repeated Measures ANOVA yields no main effect of Order (F(1,74) 1.743, p=0.191), yet it does give rise to a main effect of Argument Structure (F(1,74) 7.020, p=0.010). Further, there is an interaction of Order and Argument Structure (F(2,74) 11.313, p=0.001). As for between-subjects factors, Argument Structure is found to show marginal interactions with Proficiency (F(1,74) 2.856, p=0.095) as well as with Language and Proficiency (F(2,74) 2.711, p=0.073). This interaction reveals that there are between-group differences in slowdowns relative to the type of verb. Further, there are interactions of the factors Order, Argument Structure and Language (F(2,74) 6.529, p=0.002) as well as marginally of the factors Order, Argument
Structure, Language and Proficiency (F(2,74) 2.931, p=0.060). These interactions show that the groups perform differently on verbs differing in argument structure.

In order to explore the interactions with the factors Language and Proficiency, planned pairwise comparisons were run for each type of verb by group for all items as well as for only those items that had been correctly associated with dative case in the pretest.

Natives

In pairwise comparisons, the natives show significant differences between the SO and OS orders for accusative-active verbs ($F_1(1,20) -3.081, p=0.006; F_2(1,11) -4.814, p=0.001$) as well as for dative-active verbs ($F_1(1,20) -2.988, p=0.007; F_2(1,11) -1.236, p=0.242$), at least in the analysis by subjects. In contrast, there is no statistically significant difference for dative-experiencer verbs ($F_1(1,20) -0.108, p=0.915; F_2(1,11) -0.094, p=0.928$). Finally, a pairwise comparison of the SO order for dative-active verbs and the SO order for dative-experiencer verbs yields a significant difference ($F(1,20) -2.602, p=0.017$). This contrast illustrates that the SO order with dative-experiencer verbs is associated with significantly longer response times than SO orders with dative-active verbs.

![Figure 8.5. Experiment 7: Subtraction (SO-OS) of reaction times (in ms). Natives.](image-url)

These findings show that active verbs, irrespective of whether they are accusative-marking or dative-marking, evince longer response times for OS orders than for SO orders. In other words, differences in case marking per se do not affect reanalysis qualitatively. By contrast, experiencer verbs do not evince differential response times depending on order. Moreover, SO orders with dative experiencers invoke longer response times compared to SO orders with dative-active verbs. This pattern indicates that reanalysis is affected by differences in argument structure.
**L1 English**

The L1 English advanced group demonstrates a significant difference between SO and OS orders for accusative-active verbs ($F_1(1,8) -3.908, p=0.004; F_2(1,11) -2.073, p=0.037$) and for dative-experiencers ($F_1(1,8) -2.681, p=0.028; F_2(1,11) -2.208, p=0.078$), at least in the analysis by subjects, yet no significant difference for dative-active verbs ($F_1(1,7) 0.581, p=0.577; F_2(1,11) 0.245, p=0.811$). For dative verbs, this is the inverse pattern compared to the native pattern. In the analysis of only those items that had been judged correctly, there are no statistically significant differences in any comparison.

The L1 English near-natives show a significant difference between SO and OS orders only for accusative-active verbs in the analysis by subjects ($F_1(1,8) -2.757, p=0.028; F_2(1,11) -1.794, p=0.100$), such that this group can be considered to evince a case distinction, yet no argument distinction in response times. In sum, the L1 English group does not evince target-like differences reflecting argument structure differences between the dative-active and dative-experiencer verbs.

![Figure 8.6](image)

**Figure 8.6.** Experiment 7: Subtraction (SO-OS) of reaction times (in ms). L1 English advanced group and L1 English near-native group.

**L1 Dutch**

In pairwise comparisons, the L1 Dutch advanced group shows no significant differences in any condition ($p>0.5$).

The L1 Dutch near natives show a significant difference for accusative-active verbs ($F_1(1,9) -2.481, p=0.035; F_2(1,11) -3.007, p=0.012$), yet not in any other condition. For the comparison of SO orders between dative-active and dative-experiencer verbs, there is a marginally significant difference ($F(1,9) -2.240, p=0.052$), which suggests that the L1 Dutch near-natives differentiate according to argument structure of dative verbs.
In pairwise comparisons, the L1 Russian advanced group shows differences for accusative-active verbs ($F_1(1,11) = 3.063, p=0.011; F_2(1,11) = 1.962, p=0.076$) and dative-active verbs ($F_1(1,11) = 3.099, p=0.010; F_2(1,11) = 3.334, p=0.007$), yet not for dative experiencers ($F_1(1,11) = 0.272, p=0.791; F_2(1,5) = 0.229, p=0.828$). The L1 Russian near-natives show no differences in response times in any condition ($p>0.15$). This null effect is somewhat surprising, especially, since the comparatively lower-proficient L1 Russian advanced group does show target-like differences. In addition, the L1 Russian groups – collapsed across proficiency level – do demonstrate a target-like pattern by evincing a marginally significant difference between SO and OS orders for accusative-active verbs ($F_1(1,21) = 2.299, p=0.032; F_2(1,11) = 1.989, p=0.072$) and by showing a significant difference for dative-active verbs ($F_1(1,21) = 2.950, p=0.008; F_2(1,11) = 3.716, p=0.003$). In contrast, there is no significant difference for dative experiencers ($F_1(1,21) = 1.325, p=0.200; F_2(1,5) = 1.422, p=0.214$). Moreover, SO orders are judged significantly faster for dative-active verbs than for dative-experiencer verbs ($F(1,21) = 3.555, p=0.002$). These results show that the L1 Russians make an argument-structure distinction in response times. Hence, although for some reason, the near-natives – as a separate group – do not exhibit robust statistical differences, I will consider both L1 Russian groups as making target distinctions in the following.
Figure 8.8. Experiment 7: Subtraction (SO-OS) of reaction times (in ms). L1 Russian advanced group and L1 Russian near-native group.

Summarizing, the native group evinces longer response latencies for OS orders in all conditions except the dative-experiencer condition. This amounts to an argument structure distinction in response times. Among the L2 groups, target patterns are observed for the L1 Russian group and the L1 Dutch near-natives. In contrast, the L1 English group and the L1 Dutch advanced group show longer response times only for accusative-active verbs (L1 English advanced) or no statistically significant slowdowns at all (L1 Dutch advanced).

8.11. Accuracy: Sentences disambiguated by verbal agreement

This section reports the results for sentences disambiguated by verbal agreement. The results only show a strong SO preference in accuracy and reaction times which holds for all groups and across all verb types. Since these results do not allow for any meaningful conclusions, the reader may wish to skip this section and proceed directly to Section 8.13.

In this section, Table 8.7 shows the number (percent) of all accurate responses per condition for the sentences disambiguated by verbal agreement. Mean reaction times (RT) for all responses are also given.
<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced (n=9)</th>
<th>ENGLISH Near-Native (n=8)</th>
<th>DUTCH Advanced (n=11)</th>
<th>DUTCH Near-Native (n=10)</th>
<th>RUSSIAN Advanced (n=12)</th>
<th>RUSSIAN Near-Native (n=9)</th>
<th>GERMAN (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(9) ACC SO</td>
<td>33/54 (61%)</td>
<td>39/48 (81%)</td>
<td>51/66 (77%)</td>
<td>973ms</td>
<td>51/60 (85%)</td>
<td>1002ms</td>
<td>924ms</td>
</tr>
<tr>
<td>(10) ACC OS</td>
<td>24/54 (44%)</td>
<td>17/48 (35%)</td>
<td>10/66 (15%)</td>
<td>1024ms</td>
<td>15/60 (25%)</td>
<td>969ms</td>
<td>1003ms</td>
</tr>
<tr>
<td>(11) DAT active SO</td>
<td>35/54 (65%)</td>
<td>36/48 (75%)</td>
<td>53/66 (80%)</td>
<td>915ms</td>
<td>56/60 (93%)</td>
<td>986ms</td>
<td>1003ms</td>
</tr>
<tr>
<td>(12) DAT active OS</td>
<td>21/54 (39%)</td>
<td>18/48 (38%)</td>
<td>16/66 (24%)</td>
<td>1056ms</td>
<td>13/60 (22%)</td>
<td>1043ms</td>
<td>1011ms</td>
</tr>
<tr>
<td>(13) DAT experiencer SO</td>
<td>36/54 (67%)</td>
<td>37/48 (77%)</td>
<td>47/66 (71%)</td>
<td>1143ms</td>
<td>48/60 (80%)</td>
<td>1154ms</td>
<td>1202ms</td>
</tr>
<tr>
<td>(14) DAT experiencer OS</td>
<td>18/54 (33%)</td>
<td>15/48 (31%)</td>
<td>17/66 (26%)</td>
<td>1084ms</td>
<td>13/60 (22%)</td>
<td>1206ms</td>
<td>1098ms</td>
</tr>
</tbody>
</table>

**Table 8.7.** Experiment 7: Disambiguation by Verbal Agreement: Accuracy (in percent) and Reaction Times in Speeded Grammaticality Judgement Task.

Table 8.8. displays the same results for the subset of dative verbs that were correctly associated with dative case in the pretest on dative case.
The Interfaces at L2 Ultimate Attainment: Lexicon

Table 8.8. Experiment 7: Disambiguation by Verbal Agreement: Accuracy (in percent) and Reaction Times in Speeded Grammaticality Judgement Task. Correctly judged items only.

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced (n=9)</th>
<th>ENGLISH Near-Native (n=8)</th>
<th>DUTCH Advanced (n=11)</th>
<th>DUTCH Near-Native (n=10)</th>
<th>RUSSIAN Advanced (n=12)</th>
<th>RUSSIAN Near-Native (n=9)</th>
<th>GERMAN (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11) DAT active SO</td>
<td>16/21 (76%)</td>
<td>19/28 (68%)</td>
<td>23/31 (74%)</td>
<td>37/41 (90%)</td>
<td>43/60 (72%)</td>
<td>48/54 (89%)</td>
<td>107/126 (85%)</td>
</tr>
<tr>
<td></td>
<td>1214ms</td>
<td>1155ms</td>
<td>987ms</td>
<td>1098ms</td>
<td>1041ms</td>
<td>939ms</td>
<td>650ms</td>
</tr>
<tr>
<td>(12) DAT active OS</td>
<td>8/26 (31%)</td>
<td>9/31 (29%)</td>
<td>8/24 (33%)</td>
<td>11/46 (24%)</td>
<td>15/61 (25%)</td>
<td>24/53 (45%)</td>
<td>47/126 (37%)</td>
</tr>
<tr>
<td></td>
<td>1604ms</td>
<td>1251ms</td>
<td>1251ms</td>
<td>1049ms</td>
<td>1048ms</td>
<td>1199ms</td>
<td>840ms</td>
</tr>
<tr>
<td>(13) DAT experiencer SO</td>
<td>20/28 (71%)</td>
<td>22/31 (71%)</td>
<td>12/16 (75%)</td>
<td>35/40 (88%)</td>
<td>39/52 (75%)</td>
<td>44/51 (86%)</td>
<td>97/126 (77%)</td>
</tr>
<tr>
<td></td>
<td>1407ms</td>
<td>1472ms</td>
<td>1716ms</td>
<td>1221ms</td>
<td>1221ms</td>
<td>985ms</td>
<td>760ms</td>
</tr>
<tr>
<td>(14) DAT experiencer OS</td>
<td>8/27 (30%)</td>
<td>9/31 (29%)</td>
<td>6/16 (38%)</td>
<td>7/38 (18%)</td>
<td>9/52 (17%)</td>
<td>20/50 (40%)</td>
<td>43/126 (34%)</td>
</tr>
<tr>
<td></td>
<td>1660ms</td>
<td>1483ms</td>
<td>1195ms</td>
<td>1360ms</td>
<td>1112ms</td>
<td>1270ms</td>
<td>936ms</td>
</tr>
</tbody>
</table>

(a) For case distinctions, the Repeated Measures ANOVA yields only a main effect of Order (F(1,74) 206.346, p<0.001).

(b) For argument structure distinctions, the Repeated Measures ANOVA yields main effects of Order (F(1,74) 257.676, p<0.001) and Argument Structure (F(1,74) 4.567, p=0.036). In addition, there is an interaction of Order and Language (F(2,74) 3.551, p=0.034), indicating differences in judgement accuracy of OS orders across languages. However, subsequent planned pairwise comparisons between SO and OS orders in each condition reveal significant differences for each language group (p<0.015). These findings also hold for the analyses of items that were correctly identified in the pretest.

In sum, the groups show isomorphic patterns in comprehension accuracy for sentences disambiguated by verbal agreement. Across conditions, all groups demonstrate a strong subject-first preference; this preference is modulated neither by differences in case, nor by differences in argument structure.
8.12. Reaction times for sentences disambiguated by verbal agreement

The Repeated Measures ANOVAs reveal main effects of *Argument Structure* (F(1, 74) 41.661, p<0.001) and a main effect of *Order* (F(1, 74) 18.035, p<0.001); there are no interactions with any between-subjects factors. This finding indicates that all groups show analogous patterns of response times.

8.13. Discussion

The results from Experiment 7 can be descriptively summarized as follows:

- For sentences disambiguated by case, the natives make a case distinction and an argument structure distinction for dative verbs. The case distinction surfaces in judgement accuracy: Accusative OS orders receive lower accuracy scores than SO orders; for dative verbs, there is no accuracy difference according to order. The argument structure distinction is seen in reaction times: For accusative-active and dative-active verbs, OS orders incur longer reaction times than SO orders; for dative-experiencer verbs, there is no reaction-time difference according to order.

- The L1 English group shows differences according to proficiency
  - The L1 English advanced group makes differences between SO and OS orders in accuracy and reaction times for accusative-active verbs and for dative-experiencer verbs, yet not for dative-active verbs. This distinction does not correspond to the target pattern.
  - The L1 English near-natives show accuracy and reaction-time differences between accusative verbs, on the one hand, and both types of dative (active and experiencer) verbs, on the other. Hence, the L1 English near-natives make a distinction according to case, yet not according to argument structure.

- The L1 Russian group displays a pattern of behaviour that resembles the target pattern in terms of an argument structure distinction. However, this pattern is more pronounced for the advanced group, even though it generalizes statistically to the entire L1 Russian group.

- The L1 Dutch group shows differences according to proficiency
  - The L1 Dutch advanced group displays differences in accuracy of SO orders compared to OS orders for accusative-active and dative-active verbs, yet not for dative-experiencers; no differences emerge in reaction times in any condition.
  - The L1 Dutch near-natives show differences in judgement accuracy between SO and OS orders across verb types; differences in reaction times
obtain only for accusative-active verbs. This reaction-time pattern is in line with the argument-structure distinction made by the natives.

- For sentences disambiguated by verbal agreement, neither the natives nor the non-native groups show systematically different behaviour according to verb type. OS orders incur lower accuracy rates and longer reaction times across conditions.

Given that the results for sentences disambiguated by verbal agreement are inconclusive, I focus on sentences disambiguated by case. The native response pattern is in line with previous findings in that natives make both a case distinction and an argument structure distinction: (a) As for the case distinction, dative-marking verbs are treated differently from accusative verbs in terms of judgement accuracy in that no difference between SO and OS orders obtains for dative verbs. The identity in judgement accuracy for dative-active and dative-experiencer verbs can be considered a carry-over effect of the dative-experiencer verbs to dative verbs in general (see Chapter 4.2.2 and, e.g., Schlesewsky & Bornkessel, 2003). (b) As for the argument structure distinction, OS orders in the context of dative-active verbs invoke longer reaction times than the corresponding SO orders, which indicates that syntactic reanalysis from the default SO order to the OS order takes place. Dative experiencer verbs do not give rise to such reanalysis, which is indicative of the base OS order of dative-experiencer verbs. These findings replicate research on native speakers of German employing response-time measures (Schlesewsky & Bornkessel, 2003) and ERP measures (Bornkessel, McElree et al., 2004).

Let us consider the non-native groups individually to see (a) whether they make target distinctions according to case in judgement accuracy and (b) whether they make target distinctions according to argument structure in reaction times.

The L1 English and L1 Dutch groups manifest different behaviour according to proficiency: As for case, the L1 English advanced group appears to make a distinction between accusative and dative case in accuracy rates and reaction times. This difference, however, is not in line with the target distinction, since only dative-active verbs, yet not dative-experiencer verbs, are treated differently from accusative-active verbs. As for argument structure, the L1 English advanced group does not evince a reaction time pattern for dative experiencers that is different from accusative-active verbs. In a similar vein, the L1 Dutch advanced learners do not make a target case distinction in judgement accuracy either. They also do not differentiate between dative-experiencer verbs and other verbs in reaction times. Thus, neither the L1 Dutch advanced group nor the L1 English advanced group attests evidence of target distinctions according to case or argument structure.

---

2 It is not obvious why the results for sentences disambiguated by verbal agreement yield no differentiated results. Other studies on native German speakers report differences even under faster presentation speed (Schlesewsky & Bornkessel, 2003). In contrast to the present experiment, these other studies employed largely non-sensical sentences. This difference in materials might have affected the results.
By contrast, the L1 English near-natives and the L1 Dutch near-natives show evidence of a case distinction because there is no difference in accuracy and response times for dative verbs, while accusative verbs show reanalysis effects for OS orders. Such a distinction indicates that dative-marked objects are treated differently from accusative-marked objects. Further, however, the L1 English near-native group does not make a clear argument structure distinction, as dative-active and dative-experiencer verbs do not systematically differ from each other in reaction times. Rather, dative experiencers seem to pose greater difficulty irrespective of order, as shown in the elevated reaction times for both SO and OS orders vis à vis dative-active verbs (Table 8.5). The L1 English near-natives thus cannot be considered to demonstrate an interaction of argument structure and word order. By contrast, the L1 Dutch near-natives do show an interaction of argument structure and word order in the reaction times. Summarizing so far, then, only the L1 Dutch near-natives show both a target case distinction and a target argument structure distinction.

The L1 Russian group displays a pattern of behaviour that resembles the native pattern of an argument structure distinction in reaction times, although the pattern is more accentuated in the advanced group than with the near-natives. Nevertheless, the L1 Russian group as a whole shows a convergent performance pattern. Table 8.9 summarizes the findings of Experiment 7 for the respective groups.

<table>
<thead>
<tr>
<th></th>
<th>ENGLISH Advanced</th>
<th>ENGLISH Near-Native</th>
<th>RUSSIAN Advanced</th>
<th>RUSSIAN Near-Native</th>
<th>DUTCH Advanced</th>
<th>DUTCH Near-Native</th>
<th>GERMAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case distinction</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>(accusative versus dative)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argument Structure distinction</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>(active versus experiencer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8.9. Main findings of Experiment 7.

In terms of convergence on argument structure distinctions, the L1 Russian group and the L1 Dutch near-natives perform to criterion. For L2 ultimate attainment, Experiment 7
thus suggests that convergence at the syntax-lexicon interface is limited to L2ers whose L1s share thematic properties with the TL. Upon closer inspection, however, the pattern in Table 8.9 illustrates that convergence on argument structure does not completely align with L1 differences, since the L1 Dutch advanced group does not show target-like distinctions. I explore the sources of (non-) convergence in more detail in the following sections.

In Experiment 7, the effects of argument structure are inextricably entwined with case marking in that dative case morphologically spells out the experiencer argument in dative experiencers. It could thus be that the low accuracy on identifying dative experiencer verbs with dative case in the pretest, in particular of the L1 English and L1 Dutch advanced groups (Table 8.3), masks target argument structure distinctions. This seems unlikely for several reasons: (a) The judgement and response time patterns of the groups do not change when only the verbs that were correctly identified with dative case in the pretest are considered. (b) The L1 English near-natives do not demonstrate greater convergence on dative experiencers despite considerably higher accuracy on dative case than the L1 English advanced group. (c) The L1 English near-natives perform on a par with the L1 Dutch near-natives on knowledge of dative case in the pretest, yet, the former do not show a target argument structure distinction in the speeded judgement task, whereas the latter do. It hence seems that better knowledge of dative case marking per se does not entail better performance on argument structure distinctions.

Rather than to knowledge of case marking as such, it appears that the non-convergence on argument structure distinctions is due to L1 effects reflecting an interaction of case marking and argument structure. It seems that both the L1 English and the L1 Dutch advanced groups initially associate dative (or, non-nominative) case with an SO order, mapping all objects to the canonical object position, irrespective of their thematic properties. At near-native levels, the L1 Dutch group abandons such a canonical mapping, arguably facilitated by L1 transfer of analogous thematic properties with dative experiencers in Dutch. In contrast, the L1 English near-natives do not completely sever the association of dative case with object position. Let us put this claim into perspective, starting with L1 effects of morphological (case) marking on argument structure.

Previous off-line and on-line experiments on less proficient L2 speakers find L1 effects of argument-structure marking morphology in the acquisition of unaccusative verbs. For instance, Montrul (2000; 2001a; 2001b) reports in several cross-linguistic studies on the L2 acquisition of psych verbs that convergence in the mapping of thematic structure to morphosyntax obtains if the L1 and TL mappings of argument structure to morphosyntax are identical; for L1-TL mismatches, two patterns are observed: (a) In cases where the L1 overtly marks argument-structure distinctions morphologically and the TL does not overtly mark argument-structure changing, e.g. causative, morphology, L2ers resort to periphrasitic strategies of overtly marking argument-structure changing morphology instead of adopting the target zero marking (see also Juffs, 1996; White et
al., 1999; Whong-Barr & Schwartz, 2002). (b) Conversely, in cases where the L1 does not morphologically mark argument structure, while the TL does, L2 learners initially reject morphological marking and accept zero-marked forms. Similar findings can be seen in on-line studies. In a self-paced reading study, Juffs (1998) studied the processing of transitive verbs in intransitive contexts as well as causative/inchoative verbs that require reassignment of canonical thematic roles. L1 Japanese and Korean, L1 Chinese and L1 Romance advanced learners of English exhibited group-specific differences that did not align with L1-TL differences in argument structure. Juffs (1998) suggests that morphosyntax-argument structure correspondences in the L1, in this case the association of causative verbs with inflectional marking in Japanese and Korean, arbitrate the degree of convergence in L2 processing. Hence, off-line and on-line studies report interacting effects of morphology and argument structure. Let us consider how these interacting effects apply to dative experiencers.

In an off-line study on dative-experiencer constructions in Spanish, Montrul (1998) tested low-intermediate L1 English and L1 French learners of Spanish. English and French differ in that French instantiates both dative case and dative experiencers, whereas English has neither. The results show significant differences between the L1 English and L1 French groups in an interpretation task tapping the thematic properties of Spanish dative experiencers as well as in an acceptability judgement task probing the syntactic properties of dative experiencers. Like nominative-marked subjects, dative experiencers in preverbal position can act as controllers in Spanish (14).

(14) [Sin PRO, saber por qué] a Juan, le gusta María.
Without to know why to Juan\textsubscript{DAT} 3s-dat likes Maria\textsubscript{NOM}
‘Without knowing why, Maria pleases Juan.’

The results indicate that the non-convergence of the L1 English group on sentences like (14) stems from a subset of participants who do not make a distinction in judgements between dative experiencers and dative-marked indirect objects denoting goals. The latter cannot act as controllers in Spanish. Montrul (1998) argues that these learners seem to have associated dative case with strict objecthood, rather than allowing for dative-marked experiencers to act as syntactic subjects by virtue of their thematic prominence.

In a similar vein, the link between morphological marking and argument structure appears to underlie the non-convergence by the L1 English group and the advanced L1 Dutch group in Experiment 7. Consider the interaction of case marking and thematic structure of dative experiencers in German: On the one hand, non-nominative case marking of the experiencer object and nominative case marking of the theme suggest a configurationally canonical mapping of case to syntax, i.e. a base SO order. On the other hand, the thematic hierarchy maps the experiencer role to the highest argument position and the theme role to a lower argument position according to the universal thematic
The Interfaces at L2 Ultimate Attainment: Lexicon

hierarchy (e.g. Grimshaw, 1990); the thematic mapping thus entails an OS order. These mappings conflict in determining the syntax of dative experiencers, and the advanced L1 English and L1 Dutch learners appear to associate dative-marked (or, more generally, non-nominative-marked) objects with a configurational SO matrix. In other words, the strict morphology-to-syntax mapping of dative case to objecthood seems to curtail target-like performance at the syntax-argument structure interface for dative experiencers.

On this account, L1 transfer at the syntax-morphology interface, rather than at the level of argument structure as such, arbitrates the performance of the L1 English and L1 Dutch advanced groups. The fact that neither English nor Dutch has dative-marked experiencers seems to lead the advanced groups to associate dative objects with the canonical object position, i.e. an SO order. The results from the near-natives support this account: At near-native levels, when dative case marking has been further acquired, L1 effects of argument structure surface. Recall that the L1 Dutch near-natives differ from their L1 English counterparts by making both a case and an argument structure distinction, while the L1 English near-natives only make a case distinction between accusative and dative. The L1 Dutch group at near-native proficiency levels seems to benefit from the availability of OS orders with non-nominative-marked dative experiencers in Dutch (Broekhuis, 1992). This difference can be related to facilitatory effects of L1 argument structure for the L1 Dutch near-natives, who can make recourse to thematic properties of dative experiencers in Dutch.

This contrast between the L1 Dutch and L1 English near-natives could mean two things for the L1 English group: (a) The L1 English near-natives do not associate dative experiencers with a base OS order. (b) The L1 English near-natives do associate dative experiencers with a base OS order; yet, evidence of this thematic mapping is masked by case confounds, i.e. the canonical mapping of dative case to object position in an SO order. The present data cannot definitively adjudicate between these options, although they suggest that the second option is more likely. If thematic OS orders were not available for the L1 English near-natives, dative experiencers should be treated no differently from dative-active verbs. Yet, for the L1 English near-natives, judgement accuracy for dative experiencers is lower and reaction times are longer than for dative-active verbs. This differential response pattern suggests that the L1 English near-natives make some kind of distinction between dative verbs according to thematic properties, even though the distinctions between dative-active and dative-experiencer verbs do not translate into target-like reflexes of argument structure in speeded judgements. Such an analysis would be in line with previous findings that L1 English learners of Spanish and Japanese can acquire TL argument structure distinctions that implicate different syntactic representations with unaccusatives (e.g. Hirakawa, 1999; Montrul, 2005; White et al., 1999).

In sum, L1 effects at the syntax-morphology interface modulate the extent of convergence in the interaction of universal thematic distinctions and language-particular
syntax-to-morphology mappings. Russian has dative experiencers marked by case, Dutch has dative experiencers without overt case marking, and English instantiates no thematic OS orders or dative case marking. Following these differences in L1 properties, the L1 Russian group converges on case-marked dative experiencers in German, the L1 Dutch group converges at near-native levels, and the L1 English group does not show target-like distinctions. For the near-natives, the present results align with the L1 effects observed in Sorace’s (1993) study on auxiliary selection in the context of Italian unaccusative verbs, in which L1 French near-natives, yet not L1 English near-natives, converged on the morphosyntactic expressions of unaccusativity. As in the off-line study by Sorace (1993), the linkage of morphological marking and argument structure distinctions affects convergence in Experiment 7. In order to substantiate the relation between the morphosyntax and the argument structure of dative experiencers, further research is necessary. In particular, it will be useful to investigate the syntactic behaviour of dative experiencers in, e.g., binding and passivization, such that the interplay of argument structure and case marking can be further elucidated.

8.14. Summary

Experiment 7 finds that convergence on the target pattern of reanalysis for dative experiencers in L2 German is possible for L1 groups who have similar thematic distinctions in their L1 (Dutch, Russian). However, the proficiency effect among the L1 Dutch group suggests that non-convergence on dative experiencers is not solely related to difficulties at the syntax-lexicon interface, but aggravated by problems at the syntax-morphology interface due to insufficient mastery of dative case. I argued that the canonical association of dative case with SO orders blurs target thematic distinctions, since all L2 groups, including the L1 English group, differentiate between dative verbs according to argument structure. Pending further investigation of the effects of morphological case marking on the mapping from argument structure to syntax, I tentatively conclude that the findings on the syntax-lexicon interface are compatible with the Fundamental Identity Hypothesis.