Testing linguistic illusions with obligatory relatives in German

In the literature on relative clauses (RCs), it is observed that the German complex definite determiner *d-jenige* (roughly ‘the one’, henceforth DJ) requires the presence of a restrictive RC, contrary to the bare determiners *der/die/das* (D), as is illustrated in (1). This phenomenon has been dealt with from both theoretical linguistic and psycholinguistic perspectives (e.g., [2; 4; 7; 8]). In this paper, we report two experiments testing whether linguistic illusions, as documented in the processing literature involving e.g., NPIs (negative polarity items) with licensing requirements (e.g., [3; 6]) and agreement errors (e.g. [5]), also arise with German obligatory RCs as these phenomena all involve a (syntactic or semantic) dependency relation.

**Experiment 1** (Subject N=36, Item N=24, Filler N=84) was an online rating study based on a 2x3 design with the factors DET (D/DJ) and CLAUSE (RC1 attached to the dative D/DJ-DP, RC2 attached to the accusative DP, CC for conditions without RC), see (2). For D, all three conditions are acceptable. For DJ, given that it requires a RC, only DJ+RC1 should be acceptable. Subjects read each sentence as a whole and gave a binary rating without time limit. [7], from a grammatical perspective, discussed the RC1 vs. CC conditions for D/DJ. Here, we further computed a model adding RC2 and found a significant DETxRC interaction (LRT = 161.69, p<.0001). For D, D+RC2 was rated significantly better than D+RC1 (t = 4.75, p<.0001), but worse than D+CC (t = 3.89, p<.005), indicating preferences for local or no RC attachment [8]. For DJ, DJ+RC2 received significantly lower ratings than DJ+RC1 (t = 8.79, p<.0001). DJ+RC2 and DJ+CC did not differ, despite a numerical difference, see Table 1.

**Experiment 2** (Subject N=90, Item N=24, Filler N=80) used the same critical items. In order to detect illusion effects that might arise in early processing stages, we used speeded acceptability judgments (e.g., [1]). Our dependent variables were binary ratings, as in Exp. 1, and (log-transformed) response times (RTs). Analyses were conducted via Bayesian regression (rating: logistic, RT: linear). For D, matching Exp.1, we found lower acceptability and longer RTs for D+RC1 than D+RC2 or D+CC (Rating: E(μ) = -1.64, CrI = [-2.19, -1.06], P(δ<0)=1; RT: E(μ)=.37, CrI=[.07, .23], P(δ>0)=1), and higher acceptability and shorter RTs for D+CC than RC2 (E(μ)=.45, CrI=[.04, .86], P(δ>0)=.98; RT: E(μ)=-.12, CrI=[-.21, -.02], P(δ<0)=.98). For DJ, DJ+RC1 was more frequently accepted than RC2 or CC (E(μ)=2.19, CrI=[1.29, 3.17], P(δ<0)=1). **Focusing on illusion effects** (i.e. whether DJ+RC2, containing an RC with different attachment, would be accepted more often than DJ+CC): **First**, we found no evidence for a difference in ratings (E(μ)= .03, CrI= [-.61, .71], P(δ<0) = .54) and only weak evidence for slower RTs to RC2 than CC (E(μ)= -.07, CrI= [-.17 , .03], P(δ<0)= .90). That is, the rejection rate decreased for both conditions under the added time pressure, in comparison to Exp. 1; contrary to our prediction, the RC2 and CC condition did not differ. **Second**, however, while we did not start the study considering individual differences, the DJ-data reveal that 37 subjects (Group 1: blue in Figure 3) rated DJ+CC better than DJ+RC2, while 53 subjects (Group 2: red in Figure 3) rated DJ+RC2 better than DJ+CC (as an illusion effect would predict). A descriptive evaluation (Table 1: RT(B/R)) shows shorter RTs for Group 2 than Group 1.

**Conclusion:** We did not find evidence for illusion effects in German obligatory RCs. However, the data show individual differences in ratings/RTs: Are the results in Group 2 indicative of an illusion effect? We plan to investigate this in follow-up studies by further manipulating the speed of the word-by-word presentation as well as by systematic tests and controls for individual differences.
(1) a. Die **Frau** (die vorliest) ist da. **(D)**
b. Diejenige **Frau** *(die vorliest) ist da. **(DJ)*

('The woman who reads-out is here.'

(2) Examples of the test sentences in Experiment 1 and 2

a. Tina hat **dem Freund** den Tipp gegeben, **der** an dem Lauf teilnehmen sollte. **(D+RC1)**
b. Tina hat **dem Freund** den Tipp gegeben, **der** auf Spanisch formuliert wurde. **(D+RC2)**
c. Tina hat **dem Freund** den Tipp gegeben, **dass** er schneller starten sollte. **(D+CC)**
d. Tina hat **demjenigen Freund** den Tipp gegeben, **der** an dem Lauf … **(DJ+RC1)**
e. Tina hat **demjenigen Freund** den Tipp gegeben, **der** auf Spanisch … **(DJ+RC2)**
f. Tina hat **demjenigen Freund** den Tipp gegeben, **dass** er schneller … **(DJ+CC)**

'Tina has given the friend the tip, who should participate in the run / that he should start sooner / who was formulated in Spanish.'

**Table 1:** Descriptive results of Exp.1 & 2

<table>
<thead>
<tr>
<th>Cond.</th>
<th>Exp. 1 Rating</th>
<th>Exp. 2 Rating</th>
<th>RT (SD): RT (B)/RT (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D+RC1</td>
<td>0.42</td>
<td>0.61</td>
<td>1064 (582): 1134/1014</td>
</tr>
<tr>
<td>D+RC2</td>
<td>0.65</td>
<td>0.81</td>
<td>846 (463): 886/820</td>
</tr>
<tr>
<td>D+CC</td>
<td>0.84</td>
<td>0.89</td>
<td>754 (413): 817/711</td>
</tr>
<tr>
<td>DJ+RC1</td>
<td>0.65</td>
<td>0.70</td>
<td>873 (459): 888/864</td>
</tr>
<tr>
<td>DJ+RC2</td>
<td>0.22</td>
<td>0.47</td>
<td>954 (522): 1017/909</td>
</tr>
<tr>
<td>DJ+CC</td>
<td>0.19</td>
<td>0.48</td>
<td>917 (541): 970/878</td>
</tr>
</tbody>
</table>

**Figure 1:** RT results of Exp. 2

**Figure 2:** Rating results of Exp. 2

**Figure 3:** by participant responses for Exp. 2