

Testing linguistic illusions with obligatory relatives in German

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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: $\mathbb{E}(\mu) = -1.64$, $\text{CrI} = [-2.19, -1.06]$, $P(\delta < 0) = 1$; RT: $\mathbb{E}(\mu) = .37$, $\text{CrI} = [.07, .23]$, $P(\delta > 0) = 1$), and higher acceptability and shorter RTs for D+CC than RC2 ($\mathbb{E}(\mu) = .45$, $\text{CrI} = [.04, .86]$, $P(\delta > 0) = .98$; RT: $\mathbb{E}(\mu) = -.12$, $\text{CrI} = [-.21, -.02]$, $P(\delta < 0) = .98$); For DJ, DJ+RC1 was more frequently accepted than RC2 or CC ($\mathbb{E}(\mu) = 2.19$, $\text{CrI} = [1.29, 3.17]$, $P(\delta > 0) = 1$). **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 ($\mathbb{E}(\mu) = .03$, $\text{CrI} = [-.61, .71]$, $P(\delta < 0) = .54$) and only weak evidence for slower RTs to RC2 than CC ($\mathbb{E}(\mu) = -.07$, $\text{CrI} = [-.17, .03]$, $P(\delta < 0) = .90$). 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
 ('The woman who is reading aloud is here.')
- (2) a. **Tina hat dem Freund den Tipp gegeben, der an dem Lauf teilnehmen sollte.** (D+RC1)
 Tina has the friend the tip given who in the run participate should
 b. **Tina hat dem Freund den Tipp gegeben, der auf Spanisch formuliert wurde.** (D+RC2)
 Tina has the friend the tip given that in Spanish formulated was
 c. **Tina hat dem Freund den Tipp gegeben, dass er schneller starten sollte.** (D+CC)
 Tina has the friend the tip given that he faster start should
 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 / that was formulated in Spanish.}'

Table 1: Descriptive results of Exp.1 & 2

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

Figure 1: RT results of Exp. 2

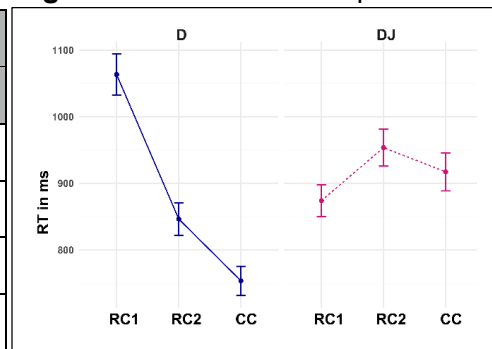


Figure 2: Rating results of Exp. 2

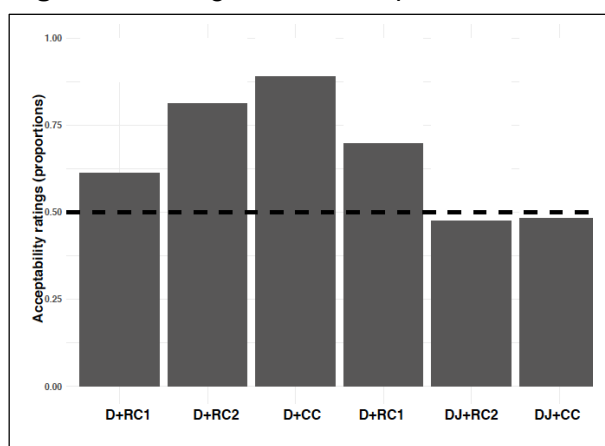
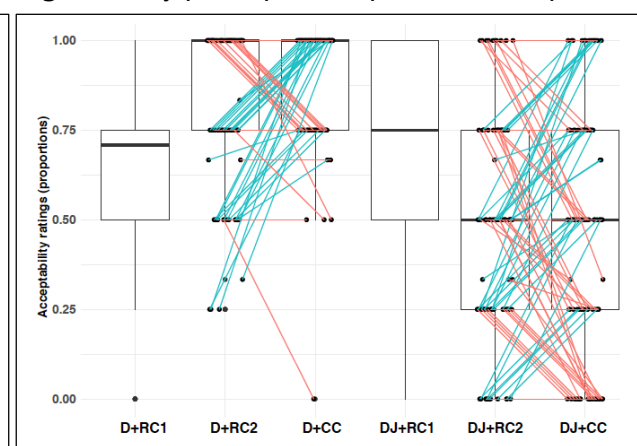


Figure 3: by participant responses for Exp. 2



References: [1] Bader and Häussler (2009). Resolving number ambiguities during language comprehension [2] Blümel (2011). Derjenige determiner that wants a relative clause. [3] Drenhaus et al. (2005). Processing Negative Polarity Items: When Negation Comes Through the Backdoor. [4] Sternefeld (2008). Syntax: Eine morphologisch motivierte generative Beschreibung des Deutschen. [5] Wagers et al. (2009). Agreement attraction in comprehension: Representations and processes [6] Xiang et al. (2009). Illusory licensing effects across dependency types: ERP evidence. [7] AUTHORS 1 [8] AUTHORS 2