

Animate efficiency and word-level processing in autistic and non-autistic adults

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Abstract: This early-stage PhD proposal investigates the real-time integration of semantic and syntactic cues during sentence comprehension. Rather than assuming a general language deficit in Autism Spectrum Condition (ASC), the project examines the conditions under which autistic and non-autistic adults may differ in online processing, especially when comprehension requires the retrieval and integration of competing representations. The study is grounded in a cue-based retrieval model of sentence processing, according to which processing difficulty reflects graded interference during dependency resolution [1]. Within this framework, animacy is treated as a lexical-semantic cue that can increase or reduce similarity-based interference between noun phrases during retrieval in relative clause processing. The present study asks whether animacy influences incremental word-level processing in Subject and Object Relative Clauses (SRCs/ORCs), where lexical-semantic cues interact with syntactic expectations over time. One of the most robust findings in sentence processing is the SRC–ORC asymmetry. In ORCs, an animate head noun (e.g. *journalist*) typically strengthens agentive expectations and increases processing cost when it is not interpreted as the agent. Conversely, inanimate head nouns (e.g. *report*) can facilitate word-level integration by weakening these expectations [2]. We aim to test the inanimate efficiency hypothesis, which suggests that autistic adults may exhibit a distinct word-processing profile: attenuated animacy-based facilitation for living entities and enhanced efficiency for inanimate stimuli.

Methodology: We will test 60 adult native speakers of German (30 ASC; 30 non-autistic). Autistic traits are assessed via the German CATI-R [3]. The experiment uses a word-by-word self-paced reading (SPR) paradigm to track incremental reading times (RTs) at specific regions of interest (ROIs). Stimuli consist of 80 critical items and 120 fillers. To control lexical properties at the word level, critical nouns are drawn from the Klenner and Göhring [4] database, contrasting “gold actor”(animate) and “gold non-actor”(inanimate) tokens matched for length and frequency. Sentences are distributed across eight experimental lists, ensuring balanced exposure to NP1 animacy, relative clause type, matrix-case configuration, and lexical item distribution across participants. As shown in Table 1, this design allows us to examine how the animacy of a single word (NP1) modulates downstream processing at the relative pronoun, the embedded noun (NP2), and the embedded verb. In addition, because cue-based retrieval models predict that interference effects should be modulated by domain-general resources, the project relates sentence-processing variation to working-memory capacity and cognitive control as candidate executive mechanisms. Working memory and cognitive control will be operationalised through behavioural measures, including the Digit Span Test, the Reading Span Test, the Flanker task, and the Stroop task, which will be related to online reading performance in conditions that place stronger demands on retrieval and revision, particularly object relative clauses with animate head nouns.

Hypotheses: We predict that non-autistic readers will show animacy-based facilitation, reflected in shorter reading times when inanimate head nouns reduce agentive expectations in object relative clauses, particularly at the embedded NP2 and the relative-clause verb, where competing syntactic and semantic cues must be integrated. By contrast, the ASC group is expected to show greater efficiency (shorter RTs) for inanimate head nouns (NP1) than the non-autistic group. Furthermore, in line with the

cue-based retrieval framework, we predict that individual differences in autistic traits and executive resources will modulate processing costs under high-interference conditions: Higher Cognitive Rigidity (subscale of the CATI-R) scores are expected to predict larger reading-time differences between high- and low- interference conditions, particularly where retrieval competition and revision demands are highest. We are currently in the initial phase of the study and expect to present initial pre-test findings at the conference.

List	Condition	NP1	RelPron	NP2	Verb RC	Sentence-end phrase
1	NOM –Anim Subj RC	Der Bewahrer,	der	den Beifall	suchte,	wurde von dem Zeugen bemerkt.
2	NOM –Anim Obj RC	Der Bewahrer,	den	der Beifall	motivierte,	wurde von dem Zeugen bemerkt.
3	NOM –Inan Subj RC	Der Beifall,	der	den Bewahrer	motivierte,	wurde von dem Zeugen bemerkt.
4	NOM –Inan Obj RC	Der Beifall,	den	der Bewahrer	suchte,	wurde von dem Zeugen bemerkt.
5	AKKU –Anim Subj RC	Den Bewahrer,	der	den Beifall	suchte,	bemerkte der Zeuge.
6	AKKU –Anim Obj RC	Den Bewahrer,	den	der Beifall	motivierte,	bemerkte der Zeuge.
7	AKKU –Inan Subj RC	Den Beifall,	der	den Bewahrer	motivierte,	bemerkte der Zeuge.
8	AKKU –Inan Obj RC	Den Beifall,	den	der Bewahrer	suchte,	bemerkte der Zeuge.

Table 1: Experimental conditions, word regions, and example stimuli.

Note. The table illustrates the eight conditions of the animacy $\times$ relative clause design. Conditions cross NP1 animacy (animate vs. inanimate), relative clause type (subject vs. object relative clause), and matrix-case configuration (nominative-initial vs. accusative-initial). NP1 is the head noun, RelPron the relative pronoun, NP2 the embedded noun phrase, and Verb RC the relative-clause verb. For example, *Der Bewahrer, den der Beifall motivierte, wurde von dem Zeugen bemerkt* can be translated as “The keeper whom the applause motivated was noticed by the witness”.

References

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