

Title: Mapping Argumentative Cohesion in the Age of AI: A Toulmin × Conjunctive Adverb Analysis of Korean EFL Student Writing and LLM Output.

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Abstract

Argumentative writing is among the most cognitively demanding genres for L2 learners (Hyland, 2003), and Korean EFL undergraduates have long shown documented difficulty with cohesion and conjunctive adverb (CA) use in English writing (Hinkel, 2002; Crossley & McNamara, 2012). In an era when generative LLMs such as ChatGPT and Claude have become pervasive in students' writing environments, this study compares Korean EFL undergraduate essays with LLM output to diagnose students' argumentative writing patterns and to prescribe pedagogical directions for English writing instruction. We built a 1:1 paired corpus ($n = 37$ per group, 971 sentences total) of Korean EFL undergraduate essays and Claude Opus 4.7 essays generated under a Korean undergraduate persona, and answered three research questions cross-analyzing 8 CA categories (Halliday & Hasan, 1976) and the six Toulmin elements (Qin & Karabacak, 2010). RQ1 (Toulmin distribution) revealed that students produce proportionally fewer CLAIMs (37.8% vs 47.9%, $d_z = -0.97$, BH-FDR $q < .001$) but cite explicit counterclaims more often (43% vs 8% of essays, $d_z = +0.62$, $q = .007$), although only 2.7% of student essays complete a full counterargument cycle. RQ2 (CA types and frequencies) showed students use all eight CA categories but with very low frequency of formal academic markers (EMPHATIC, SUMMATIVE, CONCESSIVE), while over-using EXEMPLIFICATION $4.0\times$ relative to the LLM ($d_z = +0.54$, $q = .029$). RQ3 (CA × Toulmin cross) localized the student EXEMPLIFICATION strength to DATA units (7.50% vs 1.38%, Cohen's $h = +0.32$, $q = .048$), while the LLM produced a rigid SEQUENTIAL enumeration in CLAIM units (40.00% vs 26.82%, $h = -0.28$, $q = .062$) and a CONCESSIVE template ("Of course X, but Y") in counterargument units (67%). From these diagnostic findings, the study prescribes five directions for Korean EFL writing pedagogy: (1) repertoire expansion for under-used CAs, (2) explicit Toulmin–CA alignment teaching, (3) counterargument cycle completion instruction, (4) critical comparative use of LLM output, and (5) CA × Toulmin

diagnostic assessment rubrics. The study argues that AI-era English writing pedagogy should be reconceived as diagnosis-grounded prescription rather than answer-modeling.

Keywords: *English argumentative writing, conjunctive adverbs, Toulmin argumentation, Korean EFL, AI-era writing pedagogy, cohesion, Claude Opus 4.7, diagnostic assessment*

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