Recent years have witnessed a lively debate on the nature of learners’ morphological competence and use. Some argue that a breakdown in acquisition of second-language (L2) is expected whenever features required for the analysis of L2 input are not present in the L1. Others argue that features have the same nature and etiology in first language (L1) and L2 grammars, but that the task of (re)assembly is considerable. Pursuing the role of $\phi$-feature structure in which feminine constitute a gender specification but masculine is default—and feature computations across modules, the study examines the computations of referential dependencies involving so-called non-restrictive relative clauses (NRRCs), across the syntax and discourse divide. French NRRCs introduced by qui versus lequel, which both translate to “who” with animates when linked to the subject position in the NRRC, exhibit distinct anaphoric properties that follow from the syntax-discourse processing divide. Qui NRRCs are referentially linked to local antecedents and preferentially construed with DP1 in the [DP1 de DP2] ‘DP1 of DP2’ constructions. Lequel NRRCs can modify any matching previously introduced referent and are preferentially construed with DP2 in the [DP1 de DP2] construction. In language design, these characteristics follow from the morphosyntax of the relativizers. DP lequel (as a definite expression) contributes a discourse variable referentially constrained by the RC and identified with an existing referent under feature matching. Predicative qui RCs referentially constrain the DP to which they are adjoined. Greater anaphoric freedom comes at a cost: binding relying on specialized grammatical computations is cheaper than general purpose co-reference computations in discourse. Four processing experiments verified this in L1-English L2-French learners and native speakers. Qui NRRCs are more readily processed, with no effect of the complexity of $\phi$-feature structure. The processing costs of lequel NRRCs was modulated by gender and number values. These results suggest that L2 learners’ processing system identifies two types of non-restrictive relative clauses in language design following morphological analysis.