

Article

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Critical contingency competition in L2 clause positioning acquisition: the case of concessive clause by Chinese EFL learners

<https://doi.org/10.1515/cllt-2023-0068>

Received June 18, 2023; accepted November 29, 2023; published online December 18, 2023

Abstract: Concessive clause positioning as a result of multi-cue competition has been widely examined in L1 and L2 English learners. This study furthers the present research by examining competition patterns among contingency, L1 transfer, and salience factors in concessive clause positioning by Chinese EFL learners. We extracted 1,356 concessive subordinations conjoined by *although* and *though* from native and learner argumentative essays, and used multifactorial models to examine the effectiveness, tuning tendency, and power ranking of the cues that tune concessive clause positions. A critical contingency competition was tentatively concluded in concessive clause positioning by Chinese EFL learners. That is, in cue consistency across native and learner datasets, contingency values assume the baseline role, which L1 transfer hinders while salience promotes. In addition, a critical contingency value exists, above which L1 transfer effects are not stronger than contingency and salience effects, so that cue consistency would usually be maintained and vice versa.

Keywords: contingency; L1 transfer; salience; competition; multifactorial analysis

1 Introduction

Concessive clause positioning, a type of syntactic alternation (see Examples 1 and 2), is tuned by multiple cues on different linguistic layers. For example, heavier

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adverbial clauses are usually postposed due to the right-branching nature of the English language (Quirk et al. 1972) and processibility (Hawkins 1994, 2005); adverbial clauses that contain old information are usually placed before the main clauses for smooth information flows (Birner and Ward 1998; Chafe 1984; Prince 1980) and adverbial clauses would usually be preposed to avoid ambiguity when whole subordinations are embedded in larger complex sentences (Quirk et al. 1985).

- (1) *Although major improvements to pedagogic methods and learning resources have been made in recent years, it is still the case that traditional book-based learning is often not retained over the long haul.* (from the NESSIE Corpus, Xu 2012)
- (2) *The housing built still remains in Cowley today, although some of the houses have been extended and there are areas of infill.* (from the BAWE Corpus, Nesi et al. 2008)

Recent multifactorial studies (e.g., Kang and Xu 2021; Wiechmann and Kerz 2013) have attempted to identify and rank effective cues in tuning concessive adverbial clauses by native speakers. Wiechmann and Kerz (2013) reported that anaphoric terms in adverbial clauses are more powerful in tuning concessive clause positions than other motivators, such as subordinator alternation, adverbial clause weight, and completeness of predicate verbs in adverbial clauses (termed *deranking*). Kang and Xu (2021) investigated *although*-led concessive clause positioning and concluded that clausal relationships play the most important role in placing concessive adverbial clauses. That is, concessive clauses that carry meta-discursive functions of restricting or specifying the matrixes feature a strong tendency to be postponed (see Example 2). They have also identified new effective cues in addition to those explored in Wiechmann and Kerz (2013) in tuning concessive clause positions – the existence of initial adverbials and hedging terms in concessive clauses would usually drive adverbial clauses to sentence end positions, and if all concessions are incorporated in larger complex sentences, adverbial clauses would usually be preposed to avoid ambiguity (for detailed illustration, please refer to Section 2).

Researchers have also studied EFL learners' concessive clause positioning. Wiechmann and Kerz (2014) found that compared to experts, German advanced learners focus on limited numbers of cues (such as *subordinator* and *bridging*) and pay heed to available cues (such as *subordinator*) rather than reliable ones (such as *bridging*). Rezaee and Golparvar (2017) reported similar findings by investigating 100 English research articles by Iranians.

The present multifactorial studies on concessive clause positioning by EFL learners provide solid evidence of cue competition in language choices. Nevertheless, these studies could be furthered by exploring cue-related cognitive and usage

factors in the complex second language acquisition system. The competition model (Bates and MacWhinney 1987; MacWhinney et al. 1985) holds that cue validity, related to cue contingency, is a prominent factor in language acquisition. It has long been argued that contingency (reliability of cue-outcome mapping), L1 transfer, and perceptual salience promote or hinder L2 acquisition, which adds to the complexity of language acquisition (Ellis 2006; Larsen-Freeman 1997, 2002, 2012, 2019). Usage factor competition in morpheme acquisition has been widely investigated, such as the effects of perceptual salience, attention, and modality in Cintrón-Valentín and Ellis (2016); morpheme types, availability, reliability, and phrasal formulaicity in Guo and Ellis (2021); and availability, contingency, and formulaicity in Murakami and Ellis (2022). However, the cognitive and usage factor competition studies in the acquisition of syntactic alternation tuned by multiple cues are not many. Only Whiechmann and Kerz (2014) mentioned that cue reliability assumes a more crucial role than availability in L2 learners' cue competition for concessive clause positioning. This research is one attempt to examine competition patterns among contingency, salience, and L1 transfer based on cue competition for concessive clause positioning in L2 acquisition.

We also designed an experiment on new concession datasets to obtain new findings and compare them with similar studies. First, we incorporated more potential cues to facilitate a more comprehensive view of learner behaviors. Specifically, nine cues were examined with reference to the five cues in Wiechmann and Kerz (2013) and the eight cues in Kang and Xu (2021). In addition, learners of distinct L1 backgrounds (Chinese in the Sino-Tibetan family) were examined to gain a better understanding of the effects of L1 transfer on language acquisition.

English concessive subordinations primarily convey scenarios where the main clause contrasts with the anticipated outcome set by the concessive clause. The most common subordinators for this purpose are *although* and *though* (Quirk et al. 1985: 1098). In contrast, Chinese concessive subordinations encompass a wider range, covering factual, conditional, unconditional, and tolerant concessive complex sentences (Xing 2001: 47, 467). Among these, the factual concessive subordinations in Chinese (see Example 3) bear a close resemblance to the English concessive subordinations as characterized by Quirk et al. (1985). Chinese factual concessive clauses are typically introduced by phrases like *虽然...* (*sui1ran2...*), *虽...* (*sui1...*), and *虽然...但是...* (*sui1ran2...dan4shi4*), all translating roughly into *although/though* in English (Li 1992: 222–223; Xing 2001: 47, 467).

- (3) 虽然 这 事 不 容 易, 我 们 还 得 做 去。
 although/though this matter not easy, we still have to do AUX
 ‘Although/though this matter is not easy, we still have to do it.’
 (Li 1992: 223)

From a syntactic standpoint, English and Chinese concessive clauses differ. While English allows for the placement of concessive clauses either before or after the main clause, Chinese typically positions its factual concessive clauses before the main clauses (Li and Thompson 1981: 632–635; Wu 2015: 241).

Finally, datasets comprising *although*- and *though*-conjoined concessions were chosen to enrich concessive clause positioning studies. Previous studies have investigated concessions conjoined either by two subordinators, such as *whereas* and *although* (Rezaee and Golparvar 2017; Wiechmann and Kerz 2014), or by a single subordinator, such as *although* (Kang and Xu 2021). Research findings yielded on new datasets could provide new insights for concessive clause positioning acquisition studies.

In our study, we sourced 1,356 concessive subordinations featuring *although* and *though* from university-level argumentative essays penned by both native English speakers (with a minor inclusion of A-Level essays) and Chinese EFL learners. The native speakers' essays originate from three distinct corpora: BAWE (the Section which includes native argumentative essays from the Arts and Humanities disciplinary group) (Nesi et al. 2008); LOCNESS (the Section which focuses on argumentative essays) (Granger 1998); and NESSIE (Xu 2012), amounting to a total of 1,882,981 tokens. Meanwhile, the essays by Chinese EFL learners were derived from WECCCL (Wen et al. 2009) and TECCL (Xu 2016), aggregating 2,641,427 tokens.

To ensure the datasets' comparability, we extracted all instances of the least frequent type of concessive subordinations – those of native postposed clauses (a total of 339). Subsequently, we randomly selected 339 data points each from the remaining three categories: native preposed clauses, learner postposed clauses, and learner preposed clauses. Further details can be found in Section 3.1.2. We propose the following two research questions:

- (1) What is the cue competition pattern in tuning concessive adverbial clauses by Chinese EFL learners compared to native speakers?
- (2) What possible competition pattern among contingency, salience, and L1 transfer can be concluded from the cue competition patterns?

To address the research questions, we first performed logistic regression and random forest models to explore effective cues that tune concessive clause positions by native speakers and by Chinese EFL learners, respectively. Then, we compared the cue changes in terms of their tuning tendency and power between native speakers and learners. Finally, we investigated cue changes from the perspective of competition among contingency, salience, and L1 transfer before a competition pattern was generalized.

The remainder of this paper is organized as follows: Section 2 explains the cues examined in this study; Section 3 introduces the data, cue annotation, and statistics

used; Section 4 analyzes effective cues that tune the concessive clause positioning from the native speakers' and learners' parts, compares learners' performance with that of native speakers, and answers the research questions; Section 5 offers concluding remarks.

2 Cues investigated

We examined nine cues that are reported to be effective in tuning concessive adverbial clause positions in Wiechmann and Kerz (2013; five cues corresponding to *bridging*, *subordinator*, *sub.main.ratio*, *sub.clau*, and *deranking* in this article) and Kang and Xu (2021; eight cues in this article except *subordinator*). Tables 1 and 2 present a thorough illustration of the nine cues.

In Table 1, the first column indicates the linguistic layers the cues dwell on; the second and third columns demonstrate the cues and their tagging terms; the fourth column lists the levels of each cue; the fifth column specifies each cue; the sixth column presents the preferred adverbial clause positions of specific cue levels proposed by previous literature; and the last column lists the literature of the proposals in column six. It must be noted that Table 1 does not fully explain the concessive clausal relationships owing to their nature of complexity; instead, they are thoroughly illustrated in Table 2 with reference to previous research, such as Quirk et al. (1985), Sweetser (1990), König (2006 [1994]), Barth (2000), and Kang and Xu (2021).

Although fine-grained categorization was presented for a comprehensive illustration of the concessive clausal relationships, for clarity's sake, we only analyzed the three main categories – concessive clauses countering matrix results (Example 4), countering matrix conclusions (Examples 5–9), or restricting matrix propositions (Example 10; please refer to Table 2 for detailed information).

For the annotation process, we organized the 1,356 sentences into an Excel spreadsheet, with each sentence placed in its own row within the first column. We then calculated, observed, or assessed values related to clause positions and the nine cues under investigation, entering these values into the ten subsequent cells for each respective sentence. The cue *subordinator* was directly extracted from the incorporated sentences; cue *embeddedness* was annotated upon the retrieval process; cue *sub.main.ratio* value was calculated automatically by R scripts; and cues *bridging* and *hedging* were annotated collaboratively by machines and human beings. Specifically, we composed R scripts to first retrieve and annotate clauses containing possible terms relating to *bridging* and *hedging*, before three researchers with linguistic backgrounds checked the annotation and revised where necessary; the left cues (*spc.clau.rel*, *sub.clau*, *ini.adv* and *deranking*) and concessive clause positioning were manually annotated using a drop-down menu in Excel which had predefined values

Table 1: Detailed cue information.

Linguistic layers	Cues	Tagging	Levels	Specifications	Clause positioning tendencies reported in previous literature	Relevant literature
Morphological	Subordinators	<i>subordinator</i>	Although; Though	Whether subordinating clauses contain any anaphoric items referring to the preceding clauses	Unclear	Quirk et al. (1972), Chafe (1984), Givón (1990), Prince (1980), Birner and Ward (1998)
	Bridging	<i>Bridging</i>	YES; NO			
Discursive	Specific clausal relationships	<i>spc.clau.rel</i>	DIRECT;	The concessive clausal relationships (c.f. Table 2)	Concessive clauses in indirect clausal relationships tend to precede the main clauses, while those in meta-discursive clausal relationships tend to follow the main clauses	Quirk et al. (1985), Sweetser (1990), Azar (1997), König (2006 [1994]), Barth (2000), Kang and Xu (2021)
			INDIRECT, META-DISCURSIVE			
Syntactic	Hedging	<i>Hedging</i>	YES; NO	Whether the subordinating clauses contain terms indicating possibility	Concessive clauses with hedging terms indicating possibility tend to follow the main clauses	Kang and Xu (2021)
	Length	<i>sub.main.ratio</i>	Numeric values	Ratio of subordinating and main clause word counts	Heavier concessive clauses tend to follow the main clauses	Quirk et al. (1972), Hawkins (1994, 2005), Biber et al. (1999), Diessel (2008), Wiechmann and Kerz (2013)
	Sub-clauses	<i>sub.clau</i>	YES; NO	Whether the subordinating clauses contain sub-clauses of any type	More complex concessive clauses tend to follow the main clauses	
	Embeddedness	<i>Embeddedness</i>	YES; NO	Whether the whole subordination is embedded	Embedded concessive subordinations tend to have proposed adverbial clauses	Quirk et al. (1985), Kang and Xu (2021)

Table 1: (continued)

Linguistic layers	Cues	Tagging	Levels	Specifications	Clause positioning tendencies reported in previous literature	Relevant literature
	Initial adverbials	<i>ini.adv</i>	YES; NO	in a larger complex sentence Whether initial adverbials exist in the whole subordination	Subordinations with initial adverbials tend to have postposed adverbial clauses	McCawley (1988), Rohdenburg (2003)
	Deranking	<i>Deranking</i>	YES; NO	Whether the predicate verbs of the subordinating clause is incomplete	Deranked concessive clauses tend to follow the main clauses	Quirk et al. (1985), Kang and Xu (2021)

Table 2: Concessive clausal relationship categorization.

Main categories	Sub-categories		Examples
Direct concession (the main clause is a rejection of the caused consequence of the adverbial clause)			(4) <i>Although John has tried, he still failed the exam.</i>
Indirect concession (the explicit or implicit meaning of the main clause is a rejection of the supposed proposition of the adverbial clause)	Counter-assertion	The adverbial clause supports the reversed matrix assertion.	(5) <i>Although there is some connection between the rise in crimes and the lack of prayer in public schools, the factor is too minute to be accounted for.</i>
		The implicit meaning of the adverbial clause and the matrix contradict each other.	(6) <i>Although the range of delivery time is usually long, the customer can arrange delivery around their needs.</i>
	Counter-inference and prediction		(7) <i>Although they cannot cure the disease, they have tried hard.</i> (8) <i>Although this is a dangerous disease that may be contractable, the agricultural industry will not fall by as greater degree as anticipated.</i>
Restrictive/meta-discursive concession (the adverbial clause rectifies or adds information to the main clause)	Counter-suggestion		(9) <i>Although the high price of college education is warranted, tuition fees should not be exorbitant.</i>
			(10) <i>You have done a good job, although a bit late.</i>

for each cue. The three researchers studied Tables 1 and 2 and fully discussed them before annotating distinctively on 100 data points (50 from learner and native datasets each).

To measure inter-rater agreement, we employed Light’s Kappa (Falissard 2022: 10) using the ‘lkappa’ function from the R package ‘psy’ (Falissard 2022). The average Light’s Kappa value across the four cues was 87 %, with individual scores of 74 %, 92 %, 95 %, and 88 % for *spc.clau.rel*, *sub.clau*, *ini.adv*, and *deranking*, respectively. The primary source of inconsistency emerged from *spc.clau.rel*. After annotators resolved disputes using Tables 1 and 2 as references, they proceeded with independent annotations. This collaboration improved the average Light’s Kappa value to

95 %, with cue-specific scores of 92 %, 95 %, 99 %, and 94 %. Finally, they discussed and settled the disputes. Table 3 provides a cue annotation instance of Example 11 per the standards in Tables 1 and 2.

- (11) (bold words) ...*if God is outside of time and had knowledge of time it would be knowledge of time as a “B-series,” and as such, He would have no knowledge of what moment is present, even though He would know what all events were and in what relation they stand to other events (before, simultaneous with, and after).*

3 Methodology

3.1 Data

3.1.1 Corpora

To achieve comparability, we retrieved research data from the L1 and L2 argumentative essays. Specifically, native data were extracted from BAWE (the section which includes native argumentative essays from the Arts and Humanities disciplinary group; Nesi et al. 2008), LOCNESS (the section which includes argumentative essays; Granger 1998), and NESSIE (Xu 2012). Apart from a small section of the native corpora, which consists of British A-level argumentative essays (60,209 words out of the 1,882,981 word tokens), all other essays are of university level. Learner data were from university-level argumentative essays in WECCL (Wen et al. 2009) and TECCL (Xu 2016). The general corpora profile is listed in Table 4.

3.1.2 Data extraction

The data points we extracted are complete concessions composed of one matrix and one concessive adverbial clause each. A special operation was implemented on run-on and embedded concessive sentences.

Run-on sentences, also known as fused sentences, occur when two complete sentences are squashed together without a coordinating conjunction or proper punctuation (e.g., a period or semicolon). They exist in large quantities in Chinese learner corpora and less frequently in the native corpora of this research.

For run-on sentences with exceptionally long spans, the necessary segmentations were made at the boundary of complete concessive subordinations. In Example (12), only the bold part was extracted for the present dataset because it is both a part of a run-on sentence (missing coma before *and*) and a complete concessive sentence.

Table 3: Annotation on Example 11.

Cue Annotation Specification	Subordinator Though	Bridging YES <i>Such</i> refers back to the preceding clause	spc.clau.rel Indirect The proposition that <i>He would</i> <i>have no knowl-</i> <i>edge of what</i> <i>moment is pre-</i> <i>sent</i> is in contrary to fact that <i>He</i> <i>knows a lot</i>	Hedging YES The term <i>would</i> is a hedging word	sub.main.ratio 0.65 ln(23/12) (main clause has 12 words, and the concessive clause has 23 words)	sub.clau YES The concessive clause has incorporated clauses led by <i>what</i> and <i>in what</i>	Embeddedness YES The whole concession is embedded in a larger coordina- tion complex sentence	ini.adv YES The initial adverbial <i>as</i> <i>such</i> exists in the concess- ive complex sentence	Deranking NO The concess- ive clause has a full predicate <i>would know</i>
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Table 4: Extracted corpora profile.

Corpora	Native corpora				Learner corpora		
	NESSIE	LOCNESS	BAWE	Total	WECCCL	TECCCL	Total
Essays	781	323	512	1,616	4,726	6,898	11,624
Tokens	291,911	230,138	1,360,932	1,882,981	1,243,739	1,397,688	2,641,427

- (12) *Although the patients get attacked when they hear the situation, it will reduce the patients’ conjecture and it is better to take the correct measure to cure the disease and also gain the patients’ cooperation easily.*

Concessive sentences embedded in larger complex sentences were extracted using the *complete least* principle. *Complete* principle refers to the extraction of complete concessive subordinations. Complex sentences embedded in larger complex sentences as complements, subjects, objects, coordinations, and adverbials were usually incorporated in the research datasets if they were complete sentences (bold part of Example 13). However, when a complex sentence acts as a componential part of a relative clause, it was not extracted due to its incompleteness as a sentence (bold part of Example 14).

- (13) *Yet opinions on infant baptism were not fundamental to the Christian faith, so **although details may have changed or been modified following 1520, the basic ideas remained the same.***
- (14) *This differs significantly with St. Augustine, which, **although being burned down in 1586 and rebuilt, remained a permanent settlement for two hundred years.***

According to the *least principle*, the words which introduce the embedded concessive sentences were not extracted. In other words, only concessive subordinations with a matrix and concessive adverbial clause constructions were extracted. Words such as *that*, *and*, *but*, *where*, and *when* were not included in the sentence boundary studied in the present research. Therefore, based on the *complete least* principle, the bold part of Example (13) without the introducing word *so* was extracted.

All the extracted data points are listed in Table 5. The concessive subordinations are distributed unevenly in the research corpora. Specifically, *though*-led subordinate clauses are few in number. To achieve balance, we then tagged the concessive clause positions of all *though*-led clauses and 1,000 randomly selected *although*-led clauses from the native and learner corpora, respectively. It was found that

Table 5: Data set profile.

	Although	Though
Native	1397	532
Learner	1065	896

Table 6: Base and extracted data points.

	Although	Though	Postposed	Preposed
Base data points (all <i>though</i> concessions and part of <i>although</i> concessions)				
Native	1000	532	339	1193
Learner	1000	896	350	1546
Extracted data points				
Native	408	270	339	339
Learner	311	367	339	339

The number “339” is highlighted in bold to signify its role as the benchmark for data extraction, a decision informed by the distribution of clauses. Specifically, native postposed clauses, which total 339, represent the smallest group when contrasted with the other clause types: native preposed, learner postposed, and learner preposed. The latter types are detailed in the upper rows as base data points. Consequently, “339” serves as the reference point for data extraction across other dataset segments.

concessive clauses had strong tendencies to be preposed in both datasets (see Table 6). To explore the distinctions between preposed and postposed concessive clauses, we extracted research data based on the minimum count of the sub-clause positions – 339 native postposed clauses. Finally, we extracted 1,356 concessive subordinations, 339 native postposed clauses, and 339 randomly selected native preposed, learner preposed, and learner postposed data points.

The cue distribution of the 1,356 extracted datapoints is demonstrated in Table 7.

Table 7: Cue distribution in native and learner data sets.

Cues	Subordinator		Bridging		Hedging		Embeddedness		
Levels	Although	Though	NO	YES	NO	YES	NO	YES	
Native	408	270	398	280	568	110	577	101	
Learner	311	367	306	372	629	49	615	63	
Cues	ini.adv		Deranking		sub.clau		spc.clau.rel		
Levels	NO	YES	NO	YES	NO	YES	Direct	Indirect	Meta-discursive
Native	544	134	600	78	500	178	82	422	174
Learner	478	200	660	18	592	86	181	443	54

3.2 Statistical methods

In this research on multi-cue (nine cues) and alternative outcome (concessive clause positioning), we performed mainly multifactorial analysis for effectiveness, tendency, and power ranking of the cues in tuning the concessive clause positions. Specifically, the *drop1()* function in R language (R Core Team 2019) was used to measure the effectiveness of the independent variables (the nine cues examined in this research) through model performance each time a certain variable was dropped from the model. The dropped variable that did not significantly change the model performance was deemed an invalid variable. The function *glm()* in R language (R Core Team 2019) was implemented to measure the tendency of the effective independent variables (nine tuning cues) to lead to a certain level of the dependent variable (here, postposed, or preposed adverbial clauses). Specifically, polarities of coefficients in the model reports indicate the potential dependent variable level (e.g., postposed concessive clause position) to which a certain independent variable level (e.g., subordinator *though*) would possibly lead. The function *randomForest()* (Liaw and Wiener 2002) was applied to rank the power of the effective cues in tuning the concessive adverbial clauses.

4 Results and discussion

In this section, the effective cues and their rankings on native speakers' part are presented and discussed first, based on which the corresponding results on the learners' part are presented and discussed.

4.1 Native speakers' performance

4.1.1 Effective cues on native speakers' part

We first performed the *drop1()* function in R language to measure the effectiveness of the nine cues listed in Section 2 (see Table 8). P values and asterisks demonstrate cue effectiveness. Three, two, and one asterisks mark significance values (p values) smaller than 0.001, between 0.001 and 0.01, and between 0.01 and 0.05, respectively. The p values in Table 8 indicate that six cues (*spc.clau.rel*, *sub.main.ratio*, *ini.adv*, *sub.clau*, *subordinator* and *bridging*) are effective (*deranking* being moderately effective) in tuning the concessive clause positions on the native speakers' part, but two cues (*embeddedness* and *hedging*) are ineffective.

Table 8: *drop1()* results on nine cues – native speakers.

	Df	Deviance	AIC	LRT	Pr(>Chi)	
<none>		546.77	568.77			
Subordinator	1	564.65	584.65	17.886	2.35E-05	***
ini.adv	1	566.55	586.55	19.784	8.67E-06	***
Bridging	1	558.71	578.71	11.948	0.000547	***
spc.clau.rel	2	805.95	823.95	259.18	<2.2E-16	***
sub.main.ratio	1	562.17	582.17	15.401	8.70E-05	***
sub.clau	1	560.18	580.18	13.412	0.00025	***
Deranking	1	554.56	574.56	7.794	0.005243	**
Hedging	1	547.11	567.11	0.345	0.556809	
Embeddedness	1	547.91	567.91	1.143	0.28499	

Signif. codes: 0 “***” 0.001 “**” 0.01 “*” 0.05.

We then fed the seven effective cues to a binary logistic regression model via the function *glm()*, which both checked the *drop1()* test results and yielded the tendency of the effective cues in placing the concessive adverbial clauses (preposed or postposed). Table 9 reports the results of the logistic regression model.

Coefficient values in the second column of Table 9 show the tendency of independent variable levels (e.g., subordinatorthough) to co-occur with the non-referent level of the dependent variable (here, the preposed position of the concessive adverbial clause). The positive/negative values show the attraction/repulsion of the independent variable levels to/from the preposed positions. For example, the coefficient value of subordinator though is negative (−0.9303), indicating that compared to *although*, *though* has fewer chances of leading the preposed concessive clauses than the postposed ones. It must be noted that the absolute coefficient values only demonstrate comparative power between certain independent variable levels when

Table 9: Logistic regression model results on native datasets.

	Coefficients	Std. error	z Value	Pr(> z)	
subordinatorthough	−0.9303	0.2203	−4.224	2.40E-05	***
ini.advYES	−1.1643	0.2712	−4.293	1.76E-05	***
bridgingYES	0.7612	0.2221	3.428	0.000608	***
spc.clau.relindirect	1.0631	0.279	3.811	0.000138	***
spc.clau.relmtdcsv	−4.608	0.7782	−5.921	3.19E-09	***
sub.main.ratio	−0.6288	0.165	−3.811	0.000139	***
sub.clauYES	−0.9428	0.2686	−3.51	0.000448	***
derankingYES	1.1071	0.4371	2.533	0.011323	*

Signif. codes: 0 “***” 0.001 “**” 0.01 “*” 0.05 prediction rate = 0.8.

the other independent variables are controlled at their referent levels; thus, they do not reveal the absolute power of the variables compared to other independent variables.

On the whole, the polarity values of the coefficients suggest that the preposed positions would most frequently co-occur with the subordinator *although*, anaphoric terms in adverbial clauses, indirect concessive clausal relationships, shorter and simpler adverbial clauses, non-initial adverbials, and complete (non-deranked) adverbial clauses.

Then, we compared the test results to similar multifactorial studies on concessive clause positioning – Wiechmann and Kerz (2013) and Kang and Xu (2021). The former studied 2,000 *although*- and *whereas*-led concessions from the BNC, while the latter examined 1,738 *although*-led concessions from the BAWE. These two studies have investigated five and eight of the nine cues examined in the present study (see Table 10).

We found that six cues are comparatively stable across studies: subordinator, bridging, clausal relationships, sub-clause length, smaller clauses in concessive sub-clauses, and initial adverbials. These cues have identical co-occurrence tendencies with the concessive clause positions based on various datasets.

Conversely, three cues perform unstably across studies: hedging terms in the adverbial clauses, deranking status of the adverbial clauses, and embeddedness of the whole concessive sentence. For different datasets, these three cues vary either in their effectiveness or their tendency to co-occur with concessive clause positions.

Table 10: Comparing effectiveness and concessive clause position preferences of cues in similar studies.

	This article	Wiechmann and Kerz (2013)	Kang and Xu (2021)	Stableness
Subordinator	Effective	Effective	Not examined	YES
Bridging	YES-preposed	YES-preposed	YES-preposed	YES
Clausal relationships	Indirect-preposed	Not examined	Indirect-preposed	YES
Hedging	Ineffective	Not examined	YES-postposed	NO
Sub-clause length	Shorter-preposed	Shorter-preposed	Shorter-preposed	YES
Smaller clauses in the sub-clause	YES-postposed	YES-postposed	YES-postposed	YES
Embeddedness	Ineffective	Not examined	YES-preposed	NO
Initial adverbials	YES-postposed	Not examined	YES-postposed	YES
Deranking	YES-preposed (weak)	YES-postposed	Ineffective	NO

4.1.2 Effective cue ranking on native speakers' part

We then measured the power ranking of the seven effective cues (six stable and one unstable) via random forest modelling. Specifically, we performed the function *randomForest()*, with parameters of 1,500 trees and $Mtry = 3$. The AUC value was 0.749, suggesting a satisfactory performance of the model (Figure 1).

The cues form roughly into three clusters – the Strong Group with *spc.clau.rel* assuming the utmost importance, the Mediocre Group with *ini.adv*, *sub.clau*, *subordinator* and *sub.main.ratio* being moderately important, and the Weak Group with *deranking* and *bridging* being very weak. The five stable and effective cues roughly echo Kang and Xu's (2021) finding that native speakers focus more on meaning expressing than on easy processing in placing *although*-led clauses.

The superior power of inter-clausal relationships in tuning concessive clause positions implies native speakers' priority on clause positioning based on clausal relationships. That is, they most likely tend to prepose adverse conditions to strengthen the main clauses and add restrictive clauses to soften them.

The Mediocre Group cues imply possible principles that people observe. The rankings of *sub.clau* and *sub.main.ratio* follow inter-clausal relationships, indicating a secondary focus on observing the end-weight principle (Quirk et al. 1972: 766) by native speakers – placing heavier clauses with sub-clauses and more words in the sentence final parts. The possible reasons for the end-weight principle are that (1) people have more time and space to plan for the end-positioned constituent of a construction when it is more complex, longer, or fuller (Arnold et al. 2000); (2) English is a right-branching language, which means it is easier to parse complex sub-clauses when they follow the main clauses than when they precede them

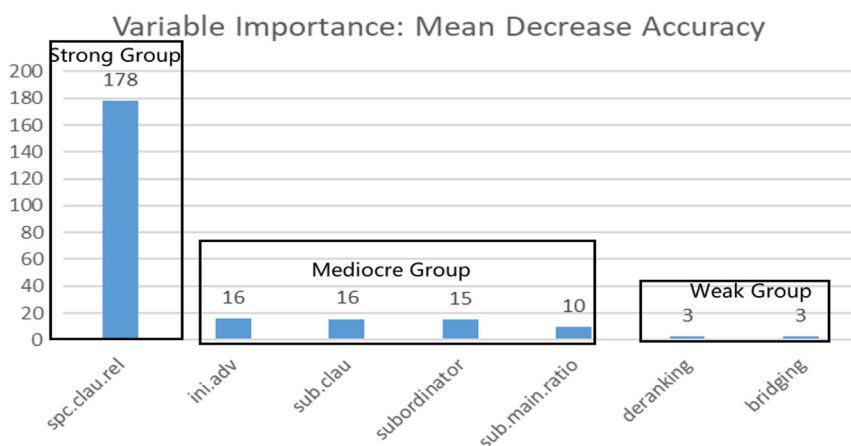


Figure 1: Cue importance in concessive clause positioning – native data.

(Hawkins 1994, 2005; Quirk et al. 1985: 1037–1039). Cue *ini.adv* ranks third, suggesting native speakers’ tendency to observe the *horror aequi* principle, which refers to language users’ reluctance to employ linguistic components that are similar in form or meaning in nearby positions (McCawley 1988; Rohdenburg 2003). Preposed adverbial clauses and sentence-initial adverbials consisting of words and phrases bear similar functions, namely connecting sentences, setting the background or tone of the propositions, or intensifying the writer’s intentions (Biber et al. 1999; Quirk et al. 1985; Talmy 2008; Virtanen 2004). According to the principle of *horror aequi*, adverbial clauses are usually postposed in complex sentences with initial adverbials to avoid repetition. Cues *subordinator* reveals native speakers’ sensitivity to morphological-lexical changes.

The Weak Group consists of the stable cue *bridging* and the unstable cue *deranking*. The former suggests the native speakers’ tendency to maintain coherence by referring to the preceding clauses, although the tendency is quite weak. The latter implies that native speakers have a weak tendency to prepose deranked concessive clauses.

4.2 Learners’ performance

4.2.1 Effective cues and their ranking on learners’ part

On the learners’ dataset, we also performed *drop1()*, logistic regression, and random forest models, yielding cue effectiveness in Table 11, cues’ tendency of co-occurring with concessive clause positions in Table 12, and the cue power ranking in terms of their importance values in Figure 2.

Table 11: *drop1()* results on nine cues – learners.

	Df	Deviance	AIC	LRT	Pr(>Chi)	
<none>		712.7	734.7			
Subordinator	1	754.02	774.02	41.325	1.29E-10	***
ini.adv	1	744.88	764.88	32.183	1.40E-08	***
Bridging	1	713.13	733.13	0.437	0.508555	
sub.clau	1	724.96	744.96	12.262	0.000462	***
spc.clau.rel	2	788.61	806.61	75.915	<2.20E-16	***
sub.main.ratio	1	740.43	760.43	27.734	1.39E-07	***
Deranking	1	712.7	732.7	0.004	0.950611	
Hedging	1	713.1	733.1	0.401	0.526558	
Embeddedness	1	744.6	764.6	31.904	1.62E-08	***

Signif. codes: 0 “***” 0.001 “**” 0.01 “*” 0.05.

Table 12: Logistic regression model results on learner datasets.

	Estimate	Std.	Error	z Value	Pr(> z)
(Intercept)	1.1735	0.2117	5.542	2.99E-08	***
subordinatorthough	−1.1959	0.1918	−6.236	4.48E-10	***
spc.clau.relindirect	0.5901	0.2043	2.889	0.003867	**
spc.clau.relmtcsv	−17.0821	487.6174	−0.035	0.972054	
sub.main.ratio	0.8945	0.1754	5.101	3.38E-07	***
sub.clauYES	−1.0632	0.3044	−3.493	0.000478	***
embeddednessYES	−1.8677	0.3585	−5.21	1.89E-07	***
ini.advYES	−1.1877	0.2053	−5.785	7.23E-09	***

Signif. codes: 0 “***” 0.001 “**” 0.01 “*” 0.05 prediction rate = 0.71.

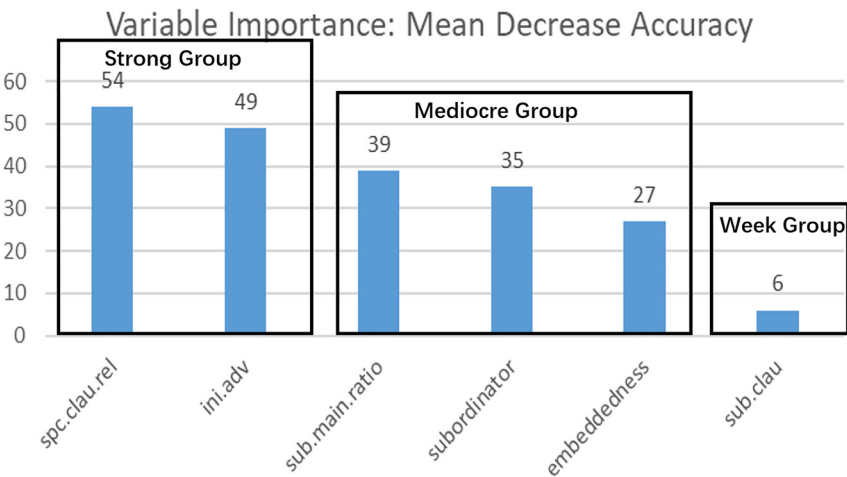


Figure 2: Cue importance in concessive clause positioning – learner data.

Tables 11 and 12 demonstrate that, compared to native speakers, learners react to fewer cues (six vs. seven), some of which perform distinctly from those on the native dataset. Specifically, only four cues (*spc.clau.rel*, *ini.adv*, *subordinator* and *sub.clau*) tune the concessive clauses in the same direction as native speakers; one cue (*sub.main.ratio*) tunes the concessive clauses opposite to native speakers, and one cue (*embeddedness*) that is ineffective on the native dataset takes effect on the learner dataset.

In addition, the effective cues on the learner dataset are less predictive than those on the native dataset (0.71 vs. 0.8), which runs contrary to Wiechmann and Kerz (2014) (0.84 vs. 0.76). It must be noted that the two studies are based on different datasets with distinct subordinators and learner native language backgrounds, which might contribute to different model predictions.

Random forest modelling (with the parameters of 1,500 tress and Mty being 3, and an Auc value of 0.706) generated cue importance in terms of mean decrease accuracy values (see Figure 2). Generally, the six effective cues are not distinguished as sharply as those on the native dataset. Nevertheless, similar to native dataset cues, they fall roughly into three categories – the Strong Group consisting of *spc.clau.rel* and *ini.adv*, the Mediocre Group consisting of *sub.main.ratio*, *subordinator* and *embeddedness*, and the Weak Group consisting of *sub.clau*. It is worth noting that in addition to the tendency distinction on tuning concessive clause positions (by *sub.main.ratio*) and effectiveness (*embeddedness*), cue ranking also changes across datasets. That is, *ini.adv* ascends from the Mediocre Group in the native dataset to the Strong Group in the learner dataset, while *sub.clau* descends from the Mediocre Group in the native dataset to the Weak Group in the learner dataset (see Tables 13 and 14).

Although learners are sensitive to six cues, only one fewer than the native speakers, the effective cues vary greatly from those on the native speakers’ part. Table 14 shows that only two cues, *spc.clau.rel* and *subordinator*, are consistent in both the tuning tendency and power groups, and the remaining four cues perform distinctively in the native and learners’ datasets. This corresponds to previous

Table 13: Comparing cue features between native and learner datasets.

Cues	Clause positioning preferences	NS ranking	LN ranking	Contingency ranking
Clausal relationships-indirect	Preposed	NS1	LN1	C1
Clausal relationships-restrictive	Postposed			0.816
				0.509
Initial adverbials	Postposed	NS2	LN1 ↑	C2
				0.254
Subordinator although	Preposed	NS2	LN2	C4
				0.150
Subordinate clauses	Postposed	NS2	LN3 ↓	C3
				0.192
Longer adverbial clauses	Preposed	NS2	LN2 ↔	C6
				0.074
Embedded in larger subordinations	Postposed	NULL	LN3 ↑	NULL
Reference to preceding clauses in sub-clauses	Ineffective	NS2	NULL ↓	C5
				0.130
Deranked sub-clauses	Ineffective	NS3	NULL	C7
				0.016
Hedging terms in sub-clauses	Ineffective	NULL	NULL	NULL

In columns 3 and 4, NS and LN are abbreviations for native speaker and learner; 1–3 signal Strong, Mediocre, and Weak Groups.

Table 14: Cues categorized by tendencies and power groups in tuning concessive clause positions.

1	Consistent tendency and consistent cue power groups	<i>spc.clau.rel</i> <i>subordinator</i>
2	Consistent tendency yet inconsistent cue power groups	<i>ini.adv</i> <i>sub.clau</i>
3	Inconsistent tendency	<i>sub.main.ratio</i>
4	Unique effective cues	LN: <i>embeddedness</i> NS: <i>bridging</i>

studies’ finding that learners react to fewer cues than native speakers (Bates and MacWhinney 1987; Ellis 2006), lay different focus on cues that are effective on native speakers’ datasets (Wiechmann and Kerz 2014), and may create their own features (learner creativity) in the language acquisition process (Deshors et al. 2018), which may contribute to the complex language acquisition system.

As has been reviewed in Section 1, the complex language acquisition system relates to contingency, salience of the cues, as well as L1 impact in terms of pre-emption and inhibition (Ellis 2006; Larsen-Freeman 1997, 2002, 2012, 2019), and we will thoroughly explore the contribution of contingency, salience, and L1 transfer to the contrasted cue performances between native speakers and learners.

4.2.2 Contingency effects

Contingency, or the reliability of form-meaning mapping, has long been argued to be the driving force in language learning (Ellis 2006; Ellis et al. 2016; Shanks 1995). Specifically, it is the co-occurrence possibility of the examined outcome and cue minus the possibility of the outcome in the context without the examined cue, the ΔP value (see Table 15 and the formula).

$$\Delta P = P(O|C) - P(O|\neg C) = \frac{a}{a+b} - \frac{c}{c+d}$$

Table 15: A contingency table showing the four possible combinations of events, indicating the presence or absence of a target cue and an outcome.

	Outcome	No outcome
Cue	a	b
No cue	c	d

(Ellis 2006: 166).

Studies on contingency effects on language learning have mostly focused on lexical acquisition, such as the acquisition order of VAC (verb-argument constructions, Ellis et al. 2016), its competition with availability, and formulaicity in lexical acquisition (Murakami and Ellis 2022). So far, little attention has been directed to the contingency of syntactic alternation and cues. In this research, we calculated the contingency values of the seven effective cues and the concessive clause positioning on native speakers’ part.

Contingency statistics were performed on a naturally distributed dataset. The native dataset on which we based the logistic regression and random forest modelling was extracted on a clause positioning basis. That is, we incorporated equal quantities of datapoints with preposed and postposed concessive clauses to explore cues that tune concessive clause positions. However, contingency must be calculated in a natural language use environment; therefore, we adjusted the former dataset to a naturally distributed one. Among all the native *although*-led concessions (1,397), we annotated 1,000 data points, and the annotation rate was 0.7158. Based on this rate, we annotated 381 *though*-led concessions among all 532 native *though*-led concessions ($381 = 532 \times 0.7158$). In total, we annotated 1,000 *although*-led and 381 *though*-led concessions on a natural distribution basis. Table 16 lists the co-occurrence counts of the cues and the concessive adverbial clause positions. The ΔP values of the preposed position and cue conditions are listed in the last column. One exception is the ΔP value of *meta-discursive* causal relationship with the *postposed* position because *spc.clau.rel* includes three levels. Compared to the reference level of *the direct* causal relationship, the *indirect* causal relationship prefers the preposed position, while *the*

Table 16: ΔP values of cues and concessive clause positions.

Ranking	Cue	Level-position	Preposed	Postposed	ΔP
1	spc.clau.rel	Direct	113	36	0.509
		Indirect-pre	950	109	
		Meta-discursive-post	11	162	
2	ini.adv	NO-pre	966	222	0.254
		YES	108	85	
3	sub.clau	NO-pre	873	189	0.192
		YES	201	118	
4	Subordinator	Although-pre	819	181	0.15
		Though	255	126	
5	Bridging	YES-pre	559	102	0.13
		NO	515	205	
6	sub.main.ratio	Shorter-pre	637	150	0.074
		Not shorter	437	157	
7	Deranking	YES-pre	129	34	0.016
		NO	945	273	

meta-discursive causal relationship prefers the postposed position. The calculation of the contingency value of the indirect clausal relationship and the preposed position is listed as an example of ΔP calculation.

$$\Delta P_{(\text{indirect-pre})} = (950 / (950 + 109) - (113 + 11) / (113 + 36 + 11 + 162)) = 0.509$$

The ranking of contingency values is incorporated in Table 13 for comparison between the ranking groups by native speakers and learners. We observed categorization by contingency values. Cues with the two biggest values (*spc.clau.rel* and *ini.adv*) correspond exactly to the learners' cue ranking; cues with the mediocre values (*sub.clau* and *subordinator*), though not corresponding to the learners' cue ranking, tune the learners' concessive clause positioning to the same tendency as that of the native speakers; cues with the lowest values (*bridging*, *sub.main.ratio* and *deranking*) either change in their effectiveness (*bridging* and *deranking*) or in their tuning tendency (*sub.main.ratio*). This categorization implies that, in our case, contingency assumes an important role in tuning learners' concessive clauses.

4.2.3 L1 transfer

L1 transfer hinders L2 acquisition when L1 and L2 distinctions exist in concepts or language structures (Ellis 2006; Ellis et al. 2016; Jarvis 2000; Jarvis and Pavlenko 2008; Larsen-Freeman 2019; MacWhinney 2008). In our research, L1 transfer is related to five cues: *spc.clau.rel*, *sub.clau*, *sub.main.ratio*, *bridging*, and *deranking*.

Distinction in performing concessive softening functions between Chinese and English prevents Chinese L2 learners from using meta-discursive concessions to restrict the main clause propositions. In Chinese, concessions are mostly realized by complex sentences led by 虽然 (*sui1ran2*, meaning *although* or *though*), 虽 (*sui1*, meaning *although* or *though*) or 虽然.....但是 (*sui1ran2...dan4shi4*, functioning as *although* or *though* construction) (Li 1992: 222–223; Xing 2001: 47, 467). Clauses led by 虽然 (*sui1ran2*, meaning *although* or *though*) typically precede the matrixes (Li and Thompson 1981: 632–635; Wu 2015: 241). The clauses that convey a softening or weakening effect are often introduced by 但是 (*dan4shi4*, meaning *but*), as noted by Xing (2001: 293), or 只是 (*zhi3shi4*, meaning *just that*), as mentioned by Li (1992: 209), and these usually follow the main clauses. The infrequent application of 虽然 (*sui1ran2*, meaning *although* or *though*) in softening functions may prevent Chinese L2 learners from constructing meta-discursive concessions. It turned out that learners not only produced meta-discursive concessions infrequently (less than 1/3 those of the than native speakers, 54 vs. 174), but they also responded inactively in placing the concessive clauses to the sentence end positions in meta-discursive concessions.

Distinction in sentence construction patterns imposes tolls on observing the end-weight principle and producing deranked clauses by Chinese learners. Specifically, this distinction leads to different cue performances of *sub.clau*, *sub.main.ratio*, and *deranking*. While English native speakers observe the end-weight principle, the Chinese language does not have that feature. In fact, Chinese features run-on (flowing) sentences, which do not show a particular weight distribution (Shen 2012; Wang 2019). In addition, Chinese modifiers (such as attributives and adverbials) all have positions before the modified components (such as noun components and predicates) (Li and Thompson 1981: 104, 320–322), which would most likely change the end-weight-related cue performance – *sub.clau* and *sub.main.ratio*. This was verified by our research results that the cue *sub.clau* became weaker in dragging the heavy clauses to the sentence end position, while *sub.main.ratio* performed opposite to that in the native dataset. Chinese lacks strict morphological alterations, as discussed by Lv (1979), Ma (1983 [1898]), Li (1992: 17), and Lu (2003: 6). Specifically, it does not possess reflexive transformations, as noted by Karlgren (2017 [1949]: 59). This typological distinction can pose challenges for Chinese students. They may find it difficult to employ full predicates in the “verb+ participle (in reflexive form)” structure and even more so when navigating the less common deranked clauses compared to complete ones. In our research, deranked clauses produced by learners are only 18, compared to the 78 produced by native speakers (see Table 7).

Distinctions in cohesion patterns hinder Chinese learners from bridging close clauses. English cohesion is usually maintained via theme-rheme progression in a flow fashion. However, Chinese anaphoric cohesion frequently covers longer spans than between neighboring clauses, which is referred to as the *sprung type* of cohesion in Yang and Wang (2017). This contradiction in cohesion maintenance may potentially contribute to the ineffectiveness of the preceding clause referring to anaphoric items in tuning concessive clauses. Our research findings run contrary to two similar studies by Rezaee and Golparvar (2017) and Wiechmann and Kerz (2014), which reported the effectiveness of cue *bridging* in tuning concessive clause positions by L2 learners. The contradictions may be caused by different learner L1 backgrounds as they examined L2 learners with L1 backgrounds of Indo-European languages (Persian and German), while our research investigated learners with a Chinese language background, which belongs to the Sino-Tibetan language family.

4.2.4 Salience

Perceptually salient cues prime the related outcomes more strongly than non-salient ones (Ellis 2006; Larsen-Freeman 2019), such as temporal adverbials, which are more effective cues in constructing a past event construal than verbs in past tense forms. In

our research, salient cues are categorized into two types: morphologically salient cues and syntactically salient cues. The former feature easy perception in their morphological forms, such as *ini.adv* and *subordinator*, while the latter can be identified following certain syntactic rules. For example, cues *sub.clau*, *bridging* and *embeddedness* could be perceived by word items such as *that*, *which*, *he*, or anaphoric content words.

4.2.5 Competition among contingency, L1 transfer, and salience

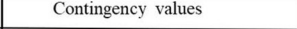






Cue power consistency in terms of tendency and ranking consistency across datasets reveals how close learners’ concessive clause positioning is to that by native speakers. It has been reported to be related to contingency values, eroded by L1 transfer, and promoted by cue salience (Ellis 2006, 2008; Larsen-Freeman 2019), which is demonstrated by the formula below.

Power Consistency = contingency + salience – L1 transfer

We listed the contingency values, salience status, and L1 transfer status in Table 17 based on the analysis in the previous sections (Sections 4.2.2–4.2.4) for a thorough observation of their specific relationships. It must be noted that for clarity, contingency of *spc.clau.rel* is set as the mean value (0.663) of its two possible conditions: *indirect* (0.509) and *meta-discursive* (0.816).

It can be seen that contingency values, compared to Salience and L1 transfer, play a baseline role in cue power consistency across datasets. Cues with high contingency values tend to exert similar effects on learner and native outcomes and vice versa. A critical line classifies cues into two groups: those in or not in power consistency with the native dataset. Above this line, L1 negative effects do not lead

Table 17: Competition among contingency, salience, and L1 transfer.

Cues	Contingency values	Salience status	L1 transfer status	Power consistency
spc.clau.rel	 0.663		L1 transfer	TC+RC
ini.adv	 0.254	Salience		TC+RC
sub.clau	 0.192	Salience	L1 transfer	TC
subordinator	 0.15	Salience		TC
bridging	 0.13	Salience	L1 transfer	-TC
sub.main.ratio	 0.074		L1 transfer	-TC
deranking	 0.016		L1 transfer	-TC
embeddedness	0	Salience		-TC

TC = tendency consistency; RC = ranking consistency.

learners to produce distinct outcomes from native speakers. Below this line, L1 negative effects usually overshadow contingency effects and cue salience, thus driving learners to perform distinctively from native speakers.

The two cues *spc.clau.rel* and *ini.adv* with the two largest contingency values are consistent across datasets both in tendency and power ranking. Although L1 transfer exists on *spc.clau.rel*, it only affects learners in producing meta-discursive concessions and thus tuning concessive clause positions. Learners are highly sensitive to preposing indirect concessive clauses to the sentence's initial position, which is identical in the case of native speakers. Cue *ini.adv*, free from L1 transfer and with morphological salience, reveals that *horror aequi* principle underlies both learners and native speakers in concessive clause positioning.

The two cues *sub.clau* and *sub.main.ratio* are both subjected to the L1 transfer of insensitivity to the end-weight principle; however, cue *sub.clau* is consistent, while *sub.main.ratio* is not. In addition to the larger contingency values of *sub.clau* (0.192 vs. 0.074), the salient grammatical markers of *sub.clau* might also provide clues for learners to follow when placing concessive clauses appropriately.

The cue *subordinator*'s comparatively large contingency value and salience status assist learners in performing similarly to native speakers on this cue.

The four inconsistent cues (ineffective or performing opposite to those on the native dataset) have smaller contingency values, and three of them are also subjected to L1 transfer. This explains, to some extent, the findings by which learners react to fewer cues than native speakers in language production (Bates and MacWhinney 1987; Ellis 2006; Wiechmann and Kerz 2014).

One interesting finding in our research is that the cue *embeddedness*, not valued by native speakers, influences learners' concessive clause positioning. The tuning tendency of this cue indicates that Chinese EFL learners would postpose concessive clauses when the concessive complex sentence is embedded in a larger sentence (see Example 15).

- (15) *I dare to say all of us don't want to waste money, although some are really rich.*

This would usually arouse ambiguity as to what the matrix of the postposed concessive clause is – the immediately preceding clause or the still larger one that incorporates the preceding clause – and is thus often avoided by native speakers (Kang and Xu 2021; Quirk et al. 1985, although this cue is not effective on the native dataset in this research). What force then drives learners to place the embedded concessive clauses at the sentence end position at the cost of arousing ambiguity? Embedded complex sentences are usually complements such as findings, statements, or propositions. Considering learners' language proficiency, it may be speculated that they are eager to put forward the cores of the complex concessions – the

matrixes – instead of the concessive conditions, to guarantee the communication of the propositional meaning. This unique feature of learners is not caused by L1 transfer and is discussed as learner creativity in Deshors et al. (2018).

Overall, in our case of concessive clause positioning, we concluded a critical contingency competition pattern among factors of contingency, salience, and L1 transfer. Specifically, (1) contingency exerts baseline effects on learners' language production; (2) consistent concessive clause positioning by learners and native speakers is boosted by salience but hindered by L1 transfer; (3) a critical contingency value marks the border of cue consistency between learners and the native speakers in terms of tuning tendency and power ranking. Cues with contingency values below the critical value are quite vulnerable to L1 transfer in language production; (4) learners may also have unique performance free from the L1 transfer influence, such as postposing concessive clauses when the concessions are embedded in larger complex sentences.

5 Conclusions

This research was an attempt to examine cue competition patterns in concessive clause positioning by Chinese EFL learners. Specifically, it focused on (1) cue competition for concessive clause positioning by Chinese EFL learners, in comparison with that by the native speakers; (2) contribution of contingency, L1 transfer, and salience to cue consistency (in terms of tuning tendency and power ranking).

First, we found that cue competition for concessive clause positioning exists in both the learner and native datasets. We then identified cue effectiveness, tuning tendency, and power ranking in each dataset by multifactorial calculations such as logistic regression and random forest modelling. Based on a comparison between cue tendency and power ranking consistency between the learner and native datasets, we identified the critical contingency competition pattern in learners' concessive clause positioning. Specifically, contingency values serve as the baseline in cue consistency with adjustments from L1 transfer (negative) and salience (positive). With the decrease in contingency values, the effects of L1 transfer and salience rise. A critical value sheds the cue consistency conditions, above which L1 transfer does not reach the level to turn the cue tendency and below which L1 transfer overshadows contingency and salience effects, to change cue tendency or effectiveness. Learner creativity affects cues that are ineffective in native speakers' language choice.

This research not only verifies the effects of contingency, L1 transfer, and salience in syntax acquisition (concessive clause positioning here), but it also roughly depicts the critical contingency competition pattern among contingency, L1 transfer, and salience, which contributes to studies on complex language acquisition systems.

Limitations exist in the research in that (1) other cues or acquisition factors may exist yet have not been covered in our research, which prevents us from drawing a comprehensive picture; (2) some cognitive or usage-based claims, such as learners sticking to the principle of *horror aequi*, were speculated on modeling results and claims on native language production, which calls for cognitive experiments for verification.

Research funding: The authors would like to acknowledge the funding provided by the Ministry of Education's Humanities and Social Sciences Research General Project (22YJA740015) and the support of the National Research Centre for Foreign Language Education at Beijing Foreign Studies University.

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