Syntactic islands as a gradient phenomenon: Evidence from Vietnamese

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Introduction. The phenomenon of syntactic islands has far-reaching implications for understanding long-distance dependencies. *Islands* are configurations that do not allow syntactic extraction, i.e., a gap would result in ungrammaticality. Consider (1a-b). Prior work using a plausibility manipulation (e.g. Traxler & Pickering 1996) shows that in (1a), people try to posit a dependency between 'book' and a gap after 'wrote', although the real gap only occurs after 'about.' But, in (1b) which is an RC island where extraction out of the RC (*the author who wrote…*) would be ungrammatical, people do <u>not</u> posit a gap after 'wrote' – providing evidence for real-time sensitivity to island constraints. In our work, we look at Vietnamese, an under-researched language where the status of islands constraints is not yet understood (e.g. Nguyen et al 2021), to explore how plausibility and syntactic constraints interact in real-time processing.

There exists a long-standing debate regarding the timecourse with which syntactic and non-syntactic (semantic/plausibility, frequency-based etc) information can be used during real-time processing (e.g. syntax-first, constraint-based vs. unrestricted race models(e.g. Farmer et al, 2007, McRae et al., 1998)). Prior work on English, a language known to have strong syntactic island constraints, indicates that during real-time processing, syntactic island constraints are powerful enough to prevent people from positing unlicensed gaps, thus *preventing plausibility effects inside island environments*. But what happens in a language like Vietnamese, where the status of syntactic islands is less clear?

The **current study** examines the processing of Vietnamese relative clause islands using the set-up in Table 1. The question is, does the parser try to posit a gap after 'wrote' even in the supposed island conditions, or only in the non-island conditions? This can be detected by manipulating the *plausibility* of the subject (*the book/the city*) and the verb (*wrote*): If readers posit a gap after 'wrote,' there should be a plausibility-related slowdown in *city*-conditions but not in *book*-conditions. We wanted to see if this plausibility effect obtains in both island and non-island conditions, to test whether online processing in Vietnamese shows strong island effects.

Design, analysis. We first ran a pilot with 10 participants. Based on a power analysis (using simr), to detect main effects of plausibility in spillover region 2 with more than 80% power, we need 60 participants. Our self-paced study (n=60 L1 Vietnamese speakers, PCIbex, conducted on the internet) manipulated two factors: (i) presence/absence of RC island structure (island/non-island) and (ii) plausibility of the subject+verb combination (plausible/implausible) which yields 4 conditions (Table 1). We used *lmer* to analyze raw RTs. Participants with an accuracy rate below 80% on comprehension questions were excluded.

Results. Word-by-word RTs are in Fig.2. We find a *main effect of plausibility* at the verb 'wrote' (β= -18.97, SE=8.58, df= 1132.67, p=0.03), and the two following words (SpillOver1: -71.67, SE=18.15, df=52.06, p<.0001; SpillOver2: p<.0001). The fact that this is a main effect suggests that *syntactic island constraints in Vietnamese are not strong enough to prevent comprehenders from positing a gap right after the verb, in striking contrast to English.*

However, it would be too hasty to conclude that Vietnamese is not sensitive to islands at all. This is because there is a significant islandxplausibility interaction on Spillover2 (Table 2). As can be seen in Fig.1, the implausible/non-island condition is read significantly slower than the implausibile/island condition. This suggests that although Vietnamese island constraints are not as 'absolute' as those in English, their effects can be detected in real time: the implausibility slowdown (diagnostic of positing a gap) is diminished in islands compared to non-islands.

In sum, our results (1) suggest that Vietnamese does not have strong RC clause island constraints – unlike English – given that we observe plausibility effects in both island or non-island conditions, (2) support the idea that islands can be gradient and we are not dealing with a binary grammatical/ungrammatical distinction (e.g. Chaves 2022) and (3) provide new evidence for constraint-based approaches to language processing from a *wh*-in-situ language where structural island constraints are less well-understood than in English.

(1a) We like **the book** that the author wrote __1 unceasingly and with great dedication about __2 while waiting for a contract. (examples from Traxler & Pickering 1996)
(1b) We like **the book** that the author who wrote __1 unceasingly and with great dedication saw __2 while waiting for a contract.

Table 1. Sample item illustrating the 4 conditions

| Condition	Sentence *(The disambiguation point is 'about' in non-island conditions and 'talked about' in island conditions)*
Non-plausible	Quyển sách mà ông tác giả đã viết rất tâm huyết về The book that the author PST wrote very passionately about '**The book** that the author **wrote** passionately about was….'
Non-implausible	Thành phố mà ông tác giả đã viết rất tâm huyết về The city that the author PST wrote very passionately about '**The city** that the author **wrote** passionately about was….'
Island-plausible	Quyển sách mà ông tác giả mà đã viết rất tâm huyết kể về The book that the author who PST wrote very passionately talked about '**The book** that the author **who wrote** passionately talked about was….'
Island-implausible	Thành phố mà ông tác giả mà đã viết rất tâm huyết kể về The city that the author who PST wrote very passionately talked about '**The city** that the author **who wrote** passionately talked about was….'
	…được nhắc đến trong một tạp chí nổi tiếng. …was mentioned in a very famous magazine.

Fig.1 Average RTs per word (SO = SpillOver)
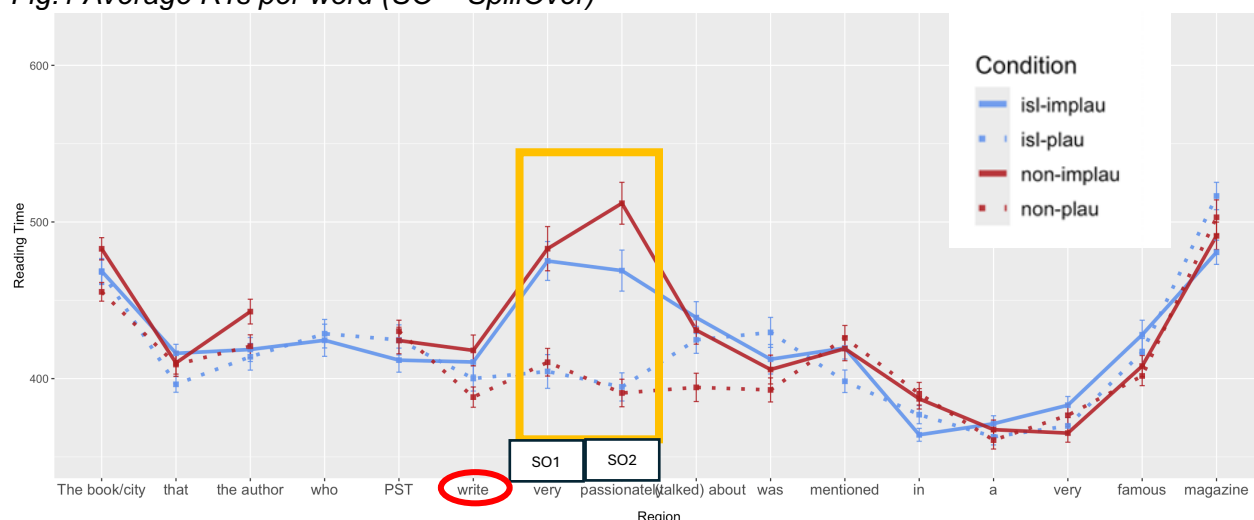
Table 2. Linear mixed-effects model fit to raw RTs for spillover region 2 after 'write'.

Fixed effects	Estimate	Std.Error	Df	t value	p
(Intercept)	448.06	19.61	55.59	22.85	<0.0001
island	17.86	9.46	1074.75	1.89	0.06
plausibility	-98.29	18.25	46.47	-5.33	<0.0001
Island: plausibility	-41.20	18.91	1075.11	-2.18	0.03

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