

Gradience in Innovatability: The Role of Gradient Grammaticality

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Introduction. Over historical time, some linguistic forms that were once ungrammatical become grammatical. For example, English *carpet* was attested as a noun by 1345 [9], but does not appear as a verb until 1626 [8]. Here, we ask what constraints govern morphological innovation, given that not all novel forms appear at once. Since classical grammars posit only one type of ungrammaticality (“bad”), they cannot use grammaticality to distinguish possible from impossible innovations (we provide evidence below against the view that pragmatic constraints alone can capture the data). Gradient theories of grammaticality [2, 4, 6], by contrast, can claim that only near-grammatical forms are eligible for innovation at each point in history. However, empirical testing of these frameworks has not concentrated on loci of change. In line with [1, 7], we take an experimental approach, exploring two zero-derivation cases which are loci of change: changes of noun to verb (e.g., *carpet* [N] > *carpet* [V]), which are very common, and changes of adjective to verb (e.g., *tidy* [Adj] > *tidy* [V]) which are much rarer. We hypothesized that among novel forms, the rarer type, adjective-to-verb (e.g., *to docile the horse*) (Table 1) would be less acceptable than the more common type, noun-to-verb (e.g., *to poncho the horse*), and that this distinction would be anticipated in online processing.

Materials. Thirty-six sets of sentences were manipulated across three conditions: Attested-Denominal, Unattested-Denominal, and Unattested-Deadjectival (see Table 1). For the Attested-Denominals, we used forms substantially present in both noun and verb uses in COCA [3]. For the Unattested-Denominals and Unattested-Deadjectivals, we used forms attested only as nouns and adjectives, respectively, in COCA. Filler sentences were drawn from Sprouse et al. [10] who normed sentences spanning the full range of a 7-point acceptability rating scale.

Procedure. A self-paced reading paradigm with a moving window condition [5] was followed by an acceptability judgment task on a 7-point Likert scale (1: Completely Nonsensical, 7: Completely Ordinary-Sounding). Participants (N=104) read 36 critical items and 84 filler items.

Analyses. A linear mixed-effects model was fitted to z-scored acceptability judgments and word-by-word reading times at each region of interest (position 4-9, see Table 1). Condition was included as a fixed effect, with random intercepts for Participant and Item. We partialled out lexical properties (e.g., word frequency) of critical words and real-world knowledge (event probability) by collecting lexical decision times and event probability ratings, respectively, in independent norming studies (see Table 2). We included the resulting z-scores (z_LDT.RT, z_EventProb) as covariates in the main analysis.

Results. Three conditions were significantly distinctive in acceptability ratings (Attested > Unattested-Denominal > Unattested-Deadjectival, see Table 3) and word reading times at the following word of the critical word (position 5) (Attested < Unattested-Denominal < Unattested-Deadjectival, see Table 4). We hypothesize that the downstream displacement is due to spillover.

Discussion. In line with the bias observed in the historical record, novel deadjectival verbs were judged worse and read more slowly than novel denominal, with pragmatic differences in the target event types controlled for. These results align with our proposal that nearly-grammatical items in a gradient-grammar framework are the strongest candidates for future admission into the grammar.

References

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Condition	Pos 1	Pos 2	Pos 3	Pos 4	Pos 5	Pos 6	Pos 7	Pos 8	Pos 9	Pos 10	Pos 11
Attested-Denominal	<i>Lucy</i>	<i>strove</i>	<i>to</i>	<i>bridle</i>	<i>the</i>	<i>horse</i>	<i>before</i>	<i>heading</i>	<i>onto</i>	<i>the</i>	<i>trail.</i>
Unattested-Denominal	<i>Lucy</i>	<i>strove</i>	<i>to</i>	<i>poncho</i>	<i>the</i>	<i>horse</i>	<i>before</i>	<i>heading</i>	<i>onto</i>	<i>the</i>	<i>trail.</i>
Unattested-Deadjectival	<i>Lucy</i>	<i>strove</i>	<i>to</i>	<i>docile</i>	<i>the</i>	<i>horse</i>	<i>before</i>	<i>heading</i>	<i>onto</i>	<i>the</i>	<i>trail.</i>

Table 1: Example stimuli. Critical words (Pos 4) in **bold**.

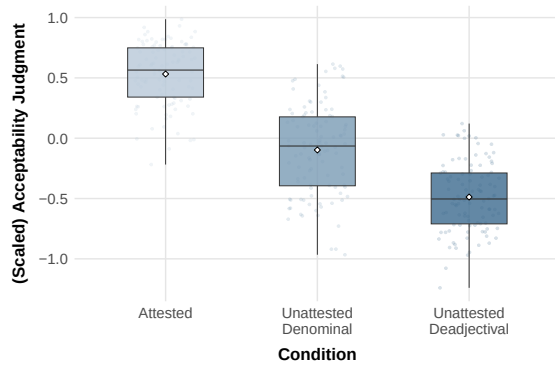


Figure 1: Z-scored acceptability across conditions.

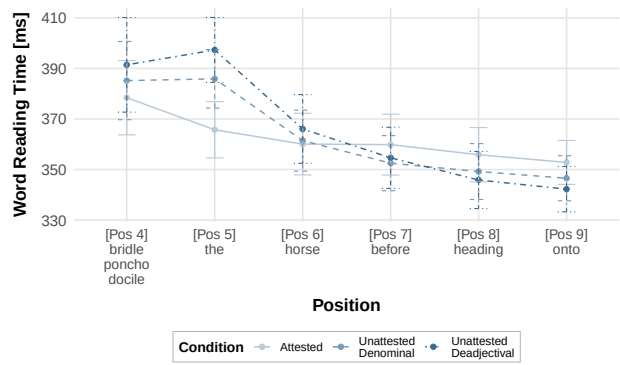


Figure 2: Word reading times [ms] across conditions.

Covariates	Description
z.EventProb	Z-scored event probability judgment on a 8-point Likert scale (0: Impossible, 1: Not likely at all, 7: Very likely) ($N=67$); 36 sets of critical events (counterbalanced) + 72 filler events
z.LDT.RT	Z-scored reaction times of Lexical Decision Task (LDT) ($N=57$); 108 words + 108 pseudowords

Table 2: Description of Covariates.

Contrast	t	p
Att – Un-Denom	20.88	< .001***
Att – Un-Deadj	31.83	< .001***
Un-Denom – Un-Deadj	12.36	< .001***

Table 3: Acceptability pairwise comparisons with consecutive contrasts (Bonferroni correction). Att = Attested; Un-Denom = Unattested-Denominal; Un-Deadj = Unattested-Deadjectival. *** $p < .001$.

	Att – Un-Denom		Att – Un-Deadj		Un-Denom – Un-Deadj	
	t	p	t	p	t	p
Pos 4	-1.39	.499	-2.61	.028*	-1.29	.588
Pos 5	-4.05	< .001***	-6.50	< .001***	-2.65	.024*
Pos 6	-0.30	1.000	-1.46	.432	-1.21	.678
Pos 7	1.71	.264	0.91	1.000	-0.77	1.000
Pos 8	1.79	.219	2.52	.035*	0.80	1.000
Pos 9	1.82	.206	2.63	.026*	0.90	1.000

Table 4: SPR pairwise comparisons with consecutive contrasts (Bonferroni correction). * $p < .05$, *** $p < .001$.