

## APPENDIX A: STIMULI FOR THREE EXPERIMENTS

The complete set of 192 stimuli with their Verb Frequency, Verb-VAC frequency, VAC-verb contingency ( $\Delta P_{cw}$ ), and Verb-VAC semantic prototypicality statistics. For each VAC, there are verbs in Stimulus Classes which reflected high, medium, and low semantic prototypicality (sem+, sem0, sem-), high, medium, and low VACfrequency, (vacfreq+, vacfreq0, vacfreq-), high, medium, and low ( $\Delta P_{cw+}$ ,  $\Delta P_{cw0}$ ,  $\Delta P_{cw-}$ ), and high, medium, and low corpus frequency verbs which never appear in the construction (never).

Stimulus Class	VAC	Verb Lemma	Verb Frequency in Corpus	Verb Frequency in VAC	Contingency $\Delta P_{cw}$	Prototypicality Betweenness Centrality
$\Delta P-$	about	tell	72651	60	-0.001616	0.031554
$\Delta P+$	about	talk	28867	3832	0.156649	0.056935
$\Delta P0$	about	understand	21977	40	0.000414	0.001054
never	about	appoint	7555	0	-0.1	0
never	about	catch	13890	0	-0.1	0
never	about	reduce	17560	0	-0.1	0
sem-	about	lie	13190	90	0.002974	0.000123
sem+	about	move	37573	74	0.000939	0.11688
sem0	about	float	1861	3	1.90E-05	0
vacfreq-	about	point	13693	1	-0.00073	0
vacfreq+	about	chat	1264	63	0.002531	0
vacfreq0	about	jump	4947	4	-0.000114	0
$\Delta P-$	across	see	184478	15	-0.007532	0.01125
$\Delta P+$	across	walk	19994	243	0.045077	0.071111
$\Delta P0$	across	ship	1233	1	0.000121	0
never	across	allow	31708	0	-0.1	0
never	across	define	9306	0	-0.1	0
never	across	predict	3709	0	-0.1	0
sem-	across	live	31402	14	0.000894	0.000852
sem+	across	hit	10278	3	-8.00E-06	0.029071
sem0	across	swim	2151	19	0.003491	0.001779

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vacfreq-	across	follow	41428	1	-0.002142	0
vacfreq+	across	flash	1543	32	0.005997	0.001457
vacfreq0	across	chase	2008	3	0.000457	3.50E-05
ΔP-	against	unite	1306	14	0.001487	0.005424
ΔP+	against	vote	5185	217	0.02389	0
ΔP0	against	settle	7061	4	4.80E-05	0.005604
never	against	call	51741	0	-0.1	0
never	against	care	7607	0	-0.1	0
never	against	conceive	1757	0	-0.1	0
sem-	against	stand	30620	173	0.017555	0.002571
sem+	against	break	18399	9	-3.30E-05	0.037351
sem0	against	crash	2160	29	0.00311	0.002037
vacfreq-	against	collect	7727	1	-0.000324	0
vacfreq+	against	brush	1955	74	0.008136	0.001034
vacfreq0	against	advance	2800	4	0.000288	0.002428
ΔP-	among	get	211788	15	-0.006672	0.040913
ΔP+	among	occur	15351	27	0.008581	0.000957
ΔP0	among	vanish	1497	2	0.000615	0.00063
never	among	add	26641	0	-0.1	0
never	among	devoted	2074	0	-0.1	0
never	among	ignore	7043	0	-0.1	0
sem-	among	remain	25526	11	0.002411	0.000254
sem+	among	play	36811	9	0.001077	0.05194
sem0	among	step	5352	3	0.000748	0.001341
vacfreq-	among	die	20979	1	-0.000831	0.001909
vacfreq+	among	circulate	1379	17	0.005869	0.001958
vacfreq0	among	belong	6152	6	0.001753	0
ΔP-	around	spring	1659	4	0.00067	0.00381
ΔP+	around	look	108373	353	0.061248	0.027268
ΔP0	around	bend	3110	3	0.000397	0.004476
never	around	abolish	1858	0	-0.1	0
never	around	consider	28494	0	-0.1	0
never	around	prefer	6608	0	-0.1	0
sem-	around	happen	30997	23	0.002643	0.000763
sem+	around	go	224168	212	0.027829	0.137623
sem0	around	concentrate	6916	8	0.001137	0.002045
vacfreq-	around	burn	4873	1	-8.40E-05	0.003727
vacfreq+	around	tighten	1420	39	0.007361	0.000468
vacfreq0	around	come	143580	51	0.001648	0.010893

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ΔP-	between	work	61068	16	-0.001509	0.011308
ΔP+	between	distinguish	3863	697	0.083798	0.000769
ΔP0	between	spill	1296	1	4.80E-05	0
never	between	coincide	1598	0	-0.1	0
never	between	grant	6608	0	-0.1	0
never	between	remember	25331	0	-0.1	0
sem-	between	open	21642	22	0.001433	4.00E-04
sem+	between	run	38688	94	0.009153	0.049416
sem0	between	pause	2978	6	0.000556	0.001114
vacfreq-	between	check	9375	1	-0.000407	0
vacfreq+	between	switch	4301	41	0.0047	0.000547
vacfreq0	between	transfer	5526	7	0.000533	0.003581
ΔP-	for	depart	1352	45	0.000421	0.002162
ΔP+	for	ask	57431	2659	0.026128	0.000292
ΔP0	for	display	5425	4	-0.000263	0
never	for	deem	1856	0	-0.1	0
never	for	protect	8741	0	-0.1	0
never	for	remind	5200	0	-0.1	0
sem-	for	sit	27625	328	0.002061	0.001226
sem+	for	hold	46230	320	0.000921	0.032849
sem0	for	proceed	4134	16	-5.70E-05	0.002099
vacfreq-	for	advise	5273	1	-0.000287	0
vacfreq+	for	opt	1722	513	0.00557	0
vacfreq0	for	flow	2535	3	-0.00011	0
ΔP-	into	squeeze	1921	46	0.000813	0.008907
ΔP+	into	fall	26023	1834	0.035264	0.028624
ΔP0	into	diminish	1369	1	-5.70E-05	0
never	into	expect	27887	0	-0.1	0
never	into	recognize	5799	0	-0.1	0
never	into	respect	1784	0	-0.1	0
sem-	into	smile	10196	53	0.000486	0
sem+	into	travel	8290	33	0.000193	0.030758
sem0	into	pop	1907	88	0.001655	0.002598
vacfreq-	into	raise	18984	1	-0.001051	0
vacfreq+	into	peer	1621	208	0.004074	0
vacfreq0	into	pin	1203	2	-2.80E-05	0
ΔP-	like	give	125313	22	-0.00568	0.02096
ΔP+	like	seem	59547	437	0.024009	0.003818
ΔP0	like	plunge	1355	1	-1.40E-05	0

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never	like	acquires	6685	0	-0.1	0
never	like	allege	1820	0	-0.1	0
never	like	require	27944	0	-0.1	0
sem-	like	become	65875	69	0.00061	0.001266
sem+	like	pass	19595	7	-0.000665	0.028837
sem0	like	spin	1650	6	0.000283	0.000266
vacfreq-	like	reflect	11060	1	-0.00056	0
vacfreq+	like	smell	2209	35	0.002067	4.60E-05
vacfreq0	like	gather	4726	4	-1.60E-05	0.000194
ΔP-	of	want	87178	57	-0.003631	0.008277
ΔP+	of	consist	6295	3021	0.067828	0.000195
ΔP0	of	desire	1386	1	-5.60E-05	0
never	of	associate	8054	0	-0.1	0
never	of	base	19034	0	-0.1	0
never	of	forgive	1934	0	-0.1	0
sem-	of	admit	10839	40	0.000291	0
sem+	of	taste	1423	30	0.000597	0.02661
sem0	of	request	2665	2	-0.000105	0
vacfreq-	of	sound	9235	1	-0.000498	0
vacfreq+	of	dream	2509	415	0.009225	0
vacfreq0	of	whisper	2817	3	-9.10E-05	0
ΔP-	off	round	1376	3	0.001794	0.01193
ΔP+	off	put	67251	26	0.012436	0.006613
ΔP0	off	strip	1517	3	0.001786	0.001001
never	off	experience	6738	0	-0.1	0
never	off	insert	1765	0	-0.1	0
never	off	provide	51092	0	-0.1	0
sem-	off	let	27961	11	0.005289	0.000633
sem+	off	cut	17759	20	0.011478	0.046312
sem0	off	fight	10193	5	0.002546	0.002982
vacfreq-	off	grow	18372	1	-0.00041	0.004147
vacfreq+	off	seal	1388	11	0.006785	0.000748
vacfreq0	off	drain	1592	3	0.001782	0.00024
ΔP-	over	think	142884	60	-0.005002	0.009273
ΔP+	over	take	172544	1696	0.076423	0.050725
ΔP0	over	knock	4333	57	0.002651	0.000913
never	over	described	23107	0	-0.1	0
never	over	invent	1804	0	-0.1	0
never	over	name	5928	0	-0.1	0

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sem-	over	lean	4464	227	0.011278	0.001142
sem+	over	cover	18578	26	0.000274	0.030188
sem0	over	struggle	3559	12	0.000409	0.001915
vacfreq-	over	seek	16511	1	-0.000879	0
vacfreq+	over	glance	3693	98	0.00477	5.80E-05
vacfreq0	over	feel	57807	9	-0.002799	0.006049
ΔP-	through	know	177192	29	-0.008638	0.000385
ΔP+	through	read	21154	112	0.004004	0.002188
ΔP0	through	sell	20170	32	0.000348	0.000171
never	through	involve	22543	0	-0.1	0
never	through	own	6331	0	-0.1	0
never	through	translate	2130	0	-0.1	0
sem-	through	watch	18830	26	0.000145	4.40E-05
sem+	through	beat	7952	3	-0.000309	0.019424
sem0	through	warm	1484	5	0.000148	0
vacfreq-	through	aim	7542	1	-0.000379	0
vacfreq+	through	wander	2332	98	0.004415	0.000654
vacfreq0	through	ease	2338	3	7.00E-06	0.00022
ΔP-	towards	make	209036	30	-0.008019	0.025677
ΔP+	towards	turn	43782	368	0.043527	0.042625
ΔP0	towards	stretch	4446	17	0.001874	0.006326
never	towards	include	34858	0	-0.1	0
never	towards	stems	1383	0	-0.1	0
never	towards	welcome	5523	0	-0.1	0
sem-	towards	help	40178	32	0.001737	0.000493
sem+	towards	extend	9524	15	0.001338	0.030295
sem0	towards	leap	1998	8	0.000887	0.000536
vacfreq-	towards	throw	10840	1	-0.000485	0
vacfreq+	towards	drift	1924	62	0.00764	0.0023
vacfreq0	towards	sink	2895	5	0.000462	0.001625
ΔP-	under	find	95330	8	-0.004632	0.00201
ΔP+	under	operate	10040	134	0.011757	0.000765
ΔP0	under	begin	41430	20	-0.000494	0.002829
never	under	aid	1506	0	-0.1	0
never	under	believe	33409	0	-0.1	0
never	under	conclude	5513	0	-0.1	0
sem-	under	claim	18435	23	0.001077	8.50E-05
sem+	under	broke	18399	27	0.001447	0.029654
sem0	under	cook	2895	2	2.10E-05	0.000217

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vacfreq-	under	eat	13612	1	-0.000674	0
vacfreq+	under	collapse	2282	39	0.003458	0.001892
vacfreq0	under	fold	1585	3	0.000187	0.002274
ΔP-	with	show	58052	93	-0.002399	0.010654
ΔP+	with	deal	16117	6407	0.060182	0.006339
ΔP0	with	fill	10409	617	0.005294	0.011627
never	with	forbid	1293	0	-0.1	0
never	with	hand	5075	0	-0.1	0
never	with	intend	10483	0	-0.1	0
sem-	with	hope	21003	21	-0.000989	4.00E-05
sem+	with	change	26434	157	1.00E-06	0.108972
sem0	with	trace	2548	2	-0.000125	0
vacfreq-	with	stress	4187	1	-0.000227	0
vacfreq+	with	disagree	1271	348	0.003246	0.000475
vacfreq0	with	promise	6048	4	-0.000304	0

## APPENDIX B: RESULTS TABLES

Table B1

The intercorrelations of the predictor variables for the stimulus set

	L10corpusfreq	VACLlength	L10VACfreq	L10 $\Delta$ Pc	L10centrality
L10corpusfreq	1.000				
VACLlength	-0.216	1.000			
L10VACfreq	0.202	-0.221	1.000		
L10 $\Delta$ Pcw	-0.035	0.019	0.433	1.000	
L10centrality	0.449	-0.214	0.436	0.235	1.000

Table B2

A GLMM predicting Sequential Lexical Decision Time

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.0054707	0.07396
VAC	(Intercept)	0.0001277	0.01130
	Residual	0.0175124	0.13233

Number of obs: 9408, groups: participant, 49; VAC, 16

Fixed effects:

	Estimate	Std.Error	t value
(Intercept)	-0.0983789	0.0267591	-3.676**
L10corpusfreq	-0.0226057	0.0026769	-8.445**
L10vacfreq	-0.0028843	0.0010565	-2.730**
L10 $\Delta$ Pcw	-0.0057752	0.0065556	-0.881
L10centrality	-0.0164550	0.0069304	-2.374**
VACLength	0.0014364	0.0007618	1.886

$R^2 = 0.256$



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Table B3

A GLMM predicting Sequential Lexical Decision Judgments

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.4017	0.6338
VAC	(Intercept)	0.3649	0.6040

Number of obs: 9408, groups: participant, 49; VAC, 16

Fixed effects:

	Estimate	Std.Error	z value
(Intercept)	0.27247	1.47447	0.1859
L10corpusfreq	0.78246	0.12263	6.381 ***
L10vacfreq	0.07985	0.04561	1.751
L10 $\Delta$ Pcw	-0.29492	0.43552	-0.677
L10centrality	1.34168	0.45272	2.964**
VACLlength	0.20245	0.03623	5.587**

$R^2 = 0.057$

Table B4

A GLMM predicting Interrupted Lexical Decision Time

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.0056641	0.07526
VAC	(Intercept)	0.0001956	0.01399
	Residual	0.0179500	0.13398

Number of obs: 8256, groups: participant, 43; VAC, 16

Fixed effects:

	Estimate	Std.Error	t value
(Intercept)	-0.0223141	0.0290899	-0.767
L10corpusfreq	-0.0236945	0.0028972	-8.178**
L10vacfreq	-0.0033028	0.0011429	-2.890**
L10ΔPcw	-0.0071499	0.0070930	-1.008
L10centrality	-0.0208759	0.0074988	-2.784**
VACLlength	0.0021597	0.0008362	2.583**

$R^2 = 0.262$

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Table B5

A GLMM predicting Interrupted Lexical Decision Judgments

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.6944	0.8333
VAC	(Intercept)	0.2852	0.5341

Number of obs: 8256, groups: participant, 43; VAC, 16

Fixed effects:

	Estimate	Std.Error	z value
(Intercept)	-1.68795	1.24028	-1.361
L10corpusfreq	0.78915	0.11150	7.078***
L10vacfreq	0.08854	0.04158	2.129*
L10ΔPcw	-0.35662	0.36201	-0.985
L10centrality	0.97982	0.36065	2.717**
VACLlength	0.27051	0.03426	7.896**

$R^2 = 0.091$

Table B6

A GLMM predicting Meaningfulness Judgment RT

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.0190186	0.13791
VAC	(Intercept)	0.0001692	0.01301
	Residual	0.0594659	0.24386

Number of obs: 8256, groups: participant, 43; VAC, 16

Fixed effects:

	Estimate	Std.Error	t value
(Intercept)	-0.2486177	0.0516696	-4.812**
L10corpusfreq	0.0117157	0.0052271	2.241**
L10vacfreq	-0.0101373	0.0020673	-4.904**
L10 $\Delta$ Pcw	-0.0752598	0.0128164	-5.872**
L10centrality	0.0133569	0.0135495	0.986
VACLength	0.0006177	0.0013833	0.447

$R^2 = 0.252$

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Table B7

A GLMM predicting Meaningfulness Judgments

Random effects:

Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.70802	0.8414
VAC	(Intercept)	0.07797	0.2792

Number of obs: 8256, groups: participant, 43; VAC, 16

Fixed effects:

	Estimate	Std.Error	z value
(Intercept)	5.42340	0.52167	10.396***
L10corpusfreq	-0.43793	0.05275	-8.302***
L10vacfreq	0.55411	0.02111	26.254***
L10ΔPcw	1.45065	0.15672	9.256***
L10centrality	0.13889	0.14040	0.989
VACLength	-0.02561	0.01526	-1.678

$R^2 = 0.275$