Supplementary Materials

Stimuli from Experiment 1

Pseudoword Target	English Word	Grammatical Class	Concreteness
nerg	adore	verb	concrete
torm	ascend	verb	concrete
soat	brighten	verb	concrete
dorl	caste	noun	abstract
liff	chemist	noun	concrete
bife	clarity	noun	abstract
sime	commend	verb	abstract
gerb	communicate	verb	concrete
turg	comprehend	verb	abstract
lunn	contentment	noun	concrete
moag	cookery	noun	concrete
bozz	deception	noun	abstract
jeck	deepen	verb	abstract
nang	depose	verb	abstract
geel	depth	noun	concrete
voad	diminish	verb	abstract
barg	disintegrate	verb	concrete
larm	disobey	verb	concrete
teeb	donate	verb	concrete
rike	educate	verb	concrete
seff	embarrass	verb	concrete
roaf	embroider	verb	concrete
goot	enlarge	verb	concrete
jorl	evolve	verb	abstract
vate	facet	noun	abstract
pook	finery	noun	concrete
raim	fitness	noun	concrete
nart	flatten	verb	concrete
leck	foresee	verb	abstract
boip	fraction	noun	concrete
chon	frequency	noun	abstract
wote	gadget	noun	concrete
jick	godmother	noun	concrete
fipe	gusto	noun	abstract
neeb	hyena	noun	concrete
junn	idiocy	noun	abstract
joff	illness	noun	concrete
loak	indifference	noun	abstract

rart	injure	verb	concrete
dibe	instruction	noun	concrete
sorl	invigorate	verb	abstract
hoak	judo	noun	concrete
fush	location	noun	abstract
jert	measurement	noun	concrete
nork	meditate	verb	concrete
toag	mislead	verb	abstract
jeeg	misrepresent	verb	abstract
rorl	motivate	verb	abstract
murl	oddity	noun	abstract
kide	owner	noun	concrete
hoaf	penetrate	verb	concrete
lorf	poach	verb	concrete
noog	priority	noun	abstract
doog	prophesy	verb	abstract
juck	proximity	noun	abstract
nade	ratio	noun	abstract
peeb	reckon	verb	abstract
sorp	regain	verb	abstract
meep	relieve	verb	abstract
paim	researcher	noun	concrete
turl	ripen	verb	concrete
lipe	sadden	verb	abstract
heek	satisfy	verb	abstract
weff	sculptor	noun	concrete
leem	sect	noun	abstract
jarm	selfishness	noun	abstract
darp	shyness	noun	abstract
dutt	specify	verb	abstract
poat	starling	noun	concrete
waim	stupidity	noun	abstract
taid	subtract	verb	concrete
laig	sweeten	verb	concrete
kaiz	timidity	noun	abstract
mout	tolerate	verb	abstract
mang	toughen	verb	abstract
buth	uncover	verb	concrete
hime	unease	noun	abstract
thit	valuation	noun	abstract
feek	wickedness	noun	concrete
mork	width	noun	concrete

Stimuli from Experiment 2

German Target	English Word	Grammatical Class	Concreteness
anweisen	remit	verb	abstract
absetzen	depose	verb	abstract
entstellen	misrepresent	verb	abstract
andeuten	foretell	verb	abstract
bändigen	subdue	verb	abstract
ehren	revere	verb	abstract
loben	commend	verb	abstract
ausgleichen	redeem	verb	abstract
austeilen	allot	verb	abstract
begreifen	comprehend	verb	abstract
beirren	mislead	verb	abstract
bevorzugen	prefer	verb	abstract
gehören	belong	verb	abstract
herabsetzen	reduce	verb	abstract
verlernen	forget	verb	abstract
klauen	shoplift	verb	concrete
abtauen	defrost	verb	concrete
entwickeln	ripen	verb	concrete
aufhellen	brighten	verb	concrete
ansteigen	ascend	verb	concrete
aufdecken	uncover	verb	concrete
abflachen	flatten	verb	concrete
verletzen	injure	verb	concrete
anbeten	adore	verb	concrete
abschrämen	carve	verb	concrete
vermitteln	communicate	verb	concrete
herabsteigen	descend	verb	concrete
atmen	breathe	verb	concrete
verschwinden	disappear	verb	concrete
erreichen	achieve	verb	concrete
Holzarbeiter	logger	noun	abstract
Beflissenheit	keenness	noun	abstract
Dummheit	silliness	noun	abstract
Gier	avarice	noun	abstract
Schwachsinn	idiocy	noun	abstract
Grundsatz	tenet	noun	abstract
Eigenartigkeit	oddity	noun	abstract
Schüchternheit	shyness	noun	abstract
Unbehagen	unease	noun	abstract
Betrug	deception	noun	abstract
Duldung	tolerance	noun	abstract
Dichte	frequency	noun	abstract
Anteil	ratio	noun	abstract

Ort	location	noun	abstract
Anwendung	practice	noun	abstract
Waschbär	raccoon	noun	concrete
Schweißer	welder	noun	concrete
Zahnheilkunde	dentistry	noun	concrete
Grobheit	rudeness	noun	concrete
Bedrängnis	affliction	noun	concrete
Bildhauer	sculptor	noun	concrete
Ärger	annoyance	noun	concrete
Ochse	oxen	noun	concrete
Drucker	printer	noun	concrete
Betrübnis	sadness	noun	concrete
Chirurg	surgeon	noun	concrete
Freude	enjoyment	noun	concrete
Arbeiter	laborer	noun	concrete
Bedienung	waiter	noun	concrete
Krankheit	illness	noun	concrete

Experiment 1

Typing task RT data

Response times (RTs) were analyzed only for correct trials and were computed as the time between the presentation of the English word and when the participant pressed 'Enter' after typing the translation. They are therefore somewhat less sensitive than traditional reaction time measures, which is a potential limitation of the RT data. Trials on which RTs were longer than 15 seconds were removed; this resulted in the exclusion of 1.33% of the data.

Main effects and interactions

Descriptive statistics for RTs are given in Table 1. Concrete words were responded to more quickly than abstract words, by items and marginally by participants (3636 vs. 4032 ms by items), $F_1(1, 14)=3.59$, $MSE=2,664,042.27$, $p=.08$, $\eta_p^2=.20$, $F_2(1, 76)=7.56$, $MSE=9,402,450.74$, $p<.01$, $\eta_p^2=.09$. Nouns were responded to more quickly than verbs (3638 vs. 3892 ms), $F_1(1, 14)=7.52$, $MSE=2,909,329.31$, $p<.05$, $\eta_p^2=.35$, $F_2(1, 76)=6.44$, $MSE=8,015,612.59$, $p<.05$, $\eta_p^2=08$. There was also a main effect of test (4404, 3683, 3208 ms), $F_1(2, 28)=16.16$, $MSE=21,744,370.73$, $p<.001$, $\eta_p^2=.54$, $F_2(2, 152)=28.03$, $MSE=19,912,323.48$, $p<.001$, $\eta_p^2=.27$. Paired samples t-tests showed that RTs at Test 2 was significantly shorter than at Test 1, $p<.05$, and RTs at Test 3 were significantly shorter than at Test 2, $p<.05$. Concreteness and test interacted marginally by participants, $F_1(2, 28)=2.61$, $p=.09$, $\eta_p^2=.16$, $F_2<1$. No other effects or interactions were significant, $Fs<1$.

Table 1. *Mean RTs for concrete and abstract nouns and verbs by test in Experiment 1*

| | Concrete | | Abstract | |
	Noun	Verb	Noun	Verb
Test 1	4223.80 (1482.91)	4709.20 (1041.04)	4271.68 (1535.70)	4409.62 (1755.15)
Test 2	3357.66 (712.92)	3621.54 (1002.23)	3871.03 (920.66)	3882.78 (876.82)
Test 3	2912.30 (812.00)	3035.03 (850.91)	3190.20 (816.84)	3694.10 (906.79)

Note. Standard deviations are given in parentheses.

Separability of the effects of concreteness and grammatical class

Regressions were conducted on the RT data collapsing across test because it did not interact with either concreteness or grammatical class. Table 2 shows the model details, which accounted for 30.3% of the variance in RTs. As for accuracy, the same pattern of results held when concreteness was entered before or after grammatical class: both concreteness and grammatical class accounted for unique variance, whereas the interaction did not.

Table 2. *Hierarchical regression analyses of RTs on the typing task in Experiment 1.*

	Concreteness First		Grammatical Class First	
	df	F	df	F
Age of acquisition, length, and frequency	3, 76	4.25**	3, 76	4.25**
Concreteness†	1, 75	7.72**	1, 74	7.54**
Grammatical class†	1, 74	7.36**	1, 75	7.54**
Concreteness x grammatical class	1, 73	< 1	1, 73	< 1

Note. ** $p < .01$, * $p < .05$, † Order indicated by column heading

Experiment 2

Scoring

RTs were analyzed only for correct trials and were computed as the time between the presentation of the English word and the participant pressing 'Enter'. In addition, trials on which RTs were longer than 20 seconds were removed; a later cutoff was used because the items in Experiment 2 were substantially longer (and thus required more time to type) than in Experiment 1. This procedure resulted in excluding 3.23% of Session 1 data and 2.92% of Session 2 data.

Main effects and interactions

Descriptive statistics for the typing task RTs are presented in Table 3. The three-way interaction between concreteness, grammatical class, and session was not significant, $F_1(1, 19)=1.66$, $MSE=931,675.53$, $p=.21$, $\eta_p^2=.08$, $F_2<1$. The two-way interaction between

concreteness and grammatical class was also not significant, Fs<1. Session did not interact significantly with concreteness, $F_1(1, 19)$=2.92, MSE=1,692,264.15, p=.10, η_p^2=.13, $F_2(1, 56)$=2.78, MSE=1,773,516.87, p=.10, η_p^2=.05, but did interact significantly with grammatical class, $F_1(1, 19)$=23.39, MSE=17,716,668.87, p<.001, η_p^2=.55, $F_2(1, 56)$=7.44, MSE=4,740,977.32, p<.01, η_p^2=.12. Because of the interaction of session with grammatical class, and the trend toward an interaction with concreteness, separate analyses were conducted for each session.

Table 3. *Mean RTs for concrete and abstract nouns and verbs by test in Experiment 2*

	Concrete		Abstract	
	Noun	Verb	Noun	Verb
Session 1				
Test 1	5417.64 (1738.98)	5761.65 (704.07)	3557.40 (2468.37)	5754.50 (3284.51)
Test 2	4067.44 (1093.11)	4715.94 (998.88)	4780.37 (155.80)	3481.13 (174.48)
Test 3	4055.09 (714.95)	4586.81 (1252.09)	3906.59 (98.31)	5306.06 (18.30)
Session 2	5219.01 (1534.35)	4522.44 (1794.90)	4543.37 (1856.61)	3674.39 (2070.49)

Note. Standard deviations are given in parentheses.

In Session 1 RTs, no main effects or interactions were significant, by subjects or by items. In Session 2 RTs, there were significant effects of both concreteness and grammatical class, however, the results were in the direction opposite of that expected. Concrete words had longer RTs than abstract words (4823.80 ms vs. 4085.99 ms), $F_1(1, 31)$=18.76, MSE=17,419,489.49, p<.001, η_p^2=.38, $F_2(1, 56)$=10.28, MSE=9,691,745.11, p<.01, η_p^2=.16. Nouns had longer RTs than verbs (4864.31 ms vs. 4045.48 ms), $F_1(1, 31)$=33.45, MSE=21,455,694.12, p<.001, η_p^2=.52, $F_2(1, 56)$=19.21, MSE=18,107,940.62, p<.001, η_p^2=.26. Concreteness and grammatical class did not interact, Fs<1.

Separability of the effects of concreteness and grammatical class

On Session 1 typing task RTs there was no interaction between test cycle and either concreteness or grammatical class, thus regressions were run on the full data collapsing across test. Table 4 shows the model details, which accounted for 49.9% of the variance in Session 1 typing RTs. Both concreteness and grammatical class, but not the interaction, accounted for significant additional variance in typing task RTs; this pattern of results held when concreteness was entered after grammatical class.

Table 4. *Hierarchical regression analyses of RTs on the typing task in Experiment 2.*

Variables	Session 1				Session 2			
	Concreteness First		Grammatical Class First		Concreteness First		Grammatical Class First	
	df	F	df	F	df	F	df	F
Age of acquisition, length, and frequency	4, 55	9.37**	4, 55	9.37**	4, 55	1.38	4, 55	1.38
Concreteness†	1, 54	5.11*	1, 53	4.48*	1, 54	6.14*	1, 53	5.73*
Grammatical class†	1, 53	3.82‡	1, 54	4.43*	1, 53	15.63**	1, 54	16.27**
Concreteness x grammatical class	1, 52	< 1	1, 52	< 1	1, 52	< 1	1, 52	< 1

Note. ** $p < .01$, * $p < .05$, ‡ $.05 \leq p \leq .10$, † Order indicated by column heading

Table 4 also shows the details of the Session 2 model, which accounted for 37.0% of variance in Day 2 typing RTs. Here, both concreteness and grammatical class again accounted for significant unique variance in Session 2 typing RTs, and the results were largely the same regardless of the order of entry.