

## Supplementary Materials Online

To the paper

### Introducing grip force as a nonverbal measure of bilingual feelings

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For further stimuli see: <https://osf.io/zhv4n/>

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## Appendix A: Sentences used in Study 1

**Table A1.** Sentence stimuli with valence and arousal norms

#	Emotionality	Language	Sentence	Valence	Arousal
01a	neg-high	English	Those who poison nature, end up killing themselves.	2.50	2.65
01b	neu-low	English	Those who observe nature, end up educating themselves.	3.31	1.46
01c	neg-high	German	Wer die Natur vergiftet, tötet sich am Ende selbst.	2.56	2.80
01d	neu-low	German	Wer die Natur beobachtet, bildet sich am Ende selbst.	3.68	1.76
02a	neg-high	English	Your selfish shopping behavior causes deadly nightmares for others.	2.46	2.77
02b	neu-low	English	Your daily shopping behavior causes certain circumstances for others.	2.88	1.85
02c	neg-high	German	Dein egoistisches Einkaufsverhalten verursacht tödliche Alpträume für andere.	2.36	3.04
02d	neu-low	German	Dein tägliches Kaufverhalten verursacht bestimmte Umstände für andere.	3.08	1.40
03a	neg-high	English	Every single jar of Nutella you buy is a cruel torture for our helpless mother nature.	2.23	2.85
03b	neu-low	English	Every single jar of Nutella you buy is a significant matter for our unique mother nature.	3.19	1.77
03c	neg-high	German	Jedes einzelne Nutellaglas, das Du kaufst, ist eine grausame Folter für unsere wehrlose Mutter-Natur.	2.12	3.00
03d	neu-low	German	Jedes einzelne Nutellaglas, das Du kaufst, ist eine bedeutende Angelegenheit für unsere einzigartige Mutter-Natur.	3.08	2.04
04a	neg-high	English	The traumatic global warming destroys thousands of lives.	1.77	3.85
04b	neu-low	English	The ongoing global warming changes many lives.	2.50	2.77
04c	neg-high	German	Die traumatische globale Erwärmung zerstört tausende Leben.	1.72	3.64
04d	neu-low	German	Die anhaltende globale Erwärmung verändert viele Leben.	2.80	2.44
05a	neg-high	English	Always remember that every avocado toast contributes to the suffocating carbon bomb.	2.62	2.96
05b	neu-low	English	Always remember that every avocado toast contributes to the atmospheric carbon condition.	2.54	2.27
05c	neg-high	German	Denk immer daran, dass jeder Avocadotoast zu der erstickenden Kohlenstoffbombe beiträgt.	2.76	2.68
05d	neu-low	German	Denk immer daran, dass jeder Avocadotoast zum atmosphärischen Kohlenstoffzustand beiträgt.	2.80	2.12
06a	neg-high	English	A disgusting amount of all food produced globally turns into toxic food waste.	2.50	2.85
06b	neu-low	English	One third of all food produced globally turns into untouched food left-overs.	2.77	2.50
06c	neg-high	German	Eine ekelhafte Menge aller weltweit produzierten Lebensmittel verwandelt sich in giftige Lebensmittelverschwendung.	2.16	2.72
06d	neu-low	German	Ein Drittel aller weltweit produzierten Lebensmittel verwandelt sich in unberührte Essensreste.	2.48	2.64
07a	neg-high	English	The plastic you use once brutally terrorizes ocean life forever.	2.00	3.42
07b	neu-low	English	The plastic you use once usually influences ocean life forever.	2.35	2.73
07c	neg-high	German	Das Plastik, das Sie einmal verwenden, terrorisiert das Leben im Meer brutal für immer.	1.44	3.84
07d	neu-low	German	Das Plastik, das Sie einmal verwenden, beeinflusst das Leben im Meer normalerweise für immer.	2.44	2.60
08a	neg-high	English	Our coffee addiction forces farmers into terrible poverty.	1.81	3.46
08b	neu-low	English	Our coffee consumption force farmers into an unmistakable position.	3.15	1.46
08c	neg-high	German	Unsere Kaffeesucht zwingt die Bauern in schreckliche Armut.	1.84	3.48
08d	neu-low	German	Unser Kaffeekonsum zwingt die Bauern in eine unverwechselbare Position.	3.24	1.44
09a	neg-high	English	If you think swimming with sharks is scary, take a swim in our dying oceans.	2.19	3.19
09b	neu-low	English	If you think swimming with whales is interesting, take a swim in our diverse oceans.	3.81	1.58
09c	neg-high	German	Wenn Sie denken, Schwimmen mit Haien sei beängstigend, schwimmen Sie in unseren sterbenden Ozeanen.	1.96	3.28
09d	neu-low	German	Wenn Sie denken, Schwimmen mit Walen sei interessant, schwimmen Sie in unseren vielfältigen Ozeanen.	3.80	1.80
10a	neg-high	English	Every obnoxious cruise ship we go on damages our broken reefs.	2.15	3.15
10b	neu-low	English	Every single cruise ship we go on alters our coral reefs.	2.54	2.35
10c	neg-high	German	Jedes widerliche Kreuzfahrtschiff, auf das wir gehen, schädigt unsere kaputten Riffe.	2.08	3.32
10d	neu-low	German	Jedes einzelne Kreuzfahrtschiff, auf das wir gehen, verändert unsere Korallenriffe.	2.52	2.28
11a	neg-high	English	Global deforestation is a disgraceful crime against all living beings.	1.46	4.04
11b	neu-low	English	Global deforestation is an important matter for all living beings.	2.73	2.38
11c	neg-high	German	Die globale Entwaldung ist ein schändliches Verbrechen an allen Lebewesen.	1.60	3.76
11d	neu-low	German	Die globale Entwaldung ist eine wichtige Angelegenheit für alle Lebewesen.	2.84	2.00
12a	neg-high	English	Ignoring the climate crisis is like committing a devastating suicide.	1.62	3.88
12b	neu-low	English	Accepting climate change is like committing to a restricted future.	2.27	2.65
12c	neg-high	German	Die Klimakrise zu ignorieren ist wie das Begehen eines verheerenden Selbstmords.	1.56	3.88
12d	neu-low	German	Den Klimawandel zu akzeptieren ist wie das Begehen einer beschränkten Zukunft.	2.28	2.60
13a	neg-high	English	Nature is not scum you can abuse, it is our home.	2.15	3.92
13b	neu-low	English	Nature is not a place you can visit, it is our home.	3.38	2.46
13c	neg-high	German	Die Natur ist kein Abschaum, den man missbrauchen kann, sie ist unser Zuhause.	1.84	3.64
13d	neu-low	German	Die Natur ist kein Ort, den man besuchen kann, sie ist unser Zuhause.	2.88	2.64
14a	neg-high	English	Don't let the Jungle Book become a sad story – stop the bloody massacre of wildlife.	1.73	3.69
14b	neu-low	English	Don't let the Jungle Book become another story – stop the continuing decline of wildlife.	2.31	3.00
14c	neg-high	German	Lass das Dschungelbuch nicht zu einer traurigen Geschichte werden – stoppe das blutige Massaker an der Tierwelt.	1.68	3.76
14d	neu-low	German	Lass das Dschungelbuch nicht eine weitere Geschichte werden – stoppe den anhaltenden Rückgang der Tierwelt.	2.64	2.48
15a	neg-high	English	Every year ten thousand elephants become victims of illegal wildlife trade.	1.42	3.88
15b	neu-low	English	Every year ten thousand elephants become objects of existing wildlife trade.	2.00	2.85
15c	neg-high	German	Jedes Jahr werden zehntausend Elefanten Opfer des illegalen Wildtierhandels.	1.44	4.04
15d	neu-low	German	Jedes Jahr werden zehntausend Elefanten Gegenstand des bestehenden Wildtierhandels.	2.24	2.84
16a	neg-high	English	As you read this, the Amazon, the beating heart of our planet, is burning like hell.	1.50	4.19
16b	neu-low	English	As you read this, the Amazon, the beating heart of our planet, is transforming rapidly.	2.65	2.27
16c	neg-high	German	Während Du dies liest, brennt der Amazonas, das schlagende Herz unseres Planeten, wie die Hölle.	1.48	4.08
16d	neu-low	German	Während Du dies liest, wandelt sich der Amazonas, das schlagende Herz unseres Planeten, rasant.	2.68	2.04

**Table A2.** Valence and arousal norms of sentence stimuli

Core affect rating	Slogan type	L1 English, n = 26		L1 German, n = 25	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Valence (SAM, 1 = sad, 5 = happy)	negative-high	1.91	0.54	2.02	0.55
	neutral-low	2.84	0.45	2.81	0.40
Arousal (SAM, 1 = calm, 5 = excited)	negative-high	3.50	0.72	3.42	0.51
	neutral-low	2.26	0.54	2.34	0.60

Note. Norms from ascending 5-point pictorial SAM valence (negative/sad = 1, positive/happy = 5) and arousal (1 = low, 5 = high) scales (Bradley & Lang, 1994)

## Appendix B: Valence and arousal norms for video stimuli in Study 2

**Table A3.** Valence and arousal norms of narrative video stimuli

Core affect rating	Video (emotionality)	L1 English		L1 German	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Valence	"Letterbox Flowers" (low)	3.2	0.5	3.0	0.4
	"Endress+Hauser" (low)	2.9	0.7	3.5	0.6
	"My father..." (high)	2.5	0.8	2.3	0.8
	"Hochzeitstag" (high)	2.1	0.8	2.1	1.0
Arousal	"Letterbox Flowers" (low)	2.4	0.8	2.2	0.8
	"Endress+Hauser" (low)	2.0	0.7	2.3	0.9
	"My father..." (high)	4.3	0.6	4.6	0.5
	"Hochzeitstag" (high)	4.6	0.6	4.3	0.7

Note. Norms from ascending 5-point pictorial SAM valence (negative/sad = 1, positive/happy = 5) and arousal (1 = low, 5 = high) scales (Bradley & Lang, 1994)

### Appendix C: Linear mixed-effects models with AUC (Area Under the Curve)

**Table A4.** Linear mixed-effects models predicting dynamometer AUC in the sentence-reading task.

Dependent variable	AUC [Newton*s], sentence reading		
	<i>b</i>	<i>SE</i>	<i>t</i>
<b>Fixed effects</b>			
(Intercept)	3.714	0.142	26.18
Language (Lg.)	0.006	0.256	0.02
Emotionality	0.727	0.061	<b>11.89</b>
Epoch	-	-	-
Sex	0.722	0.264	<b>2.74</b>
Lg. × emotion.	-0.307	0.122	<b>-2.51</b>

Note. Absolute *t*-values > 1.96 are significant (in bold). Continuous predictors were standardized. (-) = variable not relevant for the model.

**Model comparisons for sentence reading:** AUC (log-transformed) improved fit of the LMM predicting pupil dilation significantly beyond the null model,  $\chi^2(1) = 10.94$ ,  $p < .001$ , based on a positive association between pupil dilation and AUC,  $b = .011$ ,  $SE = .003$ ,  $t = 3.43$ .

**Table A5.** Linear mixed-effects models predicting dynamometer AUC in the narrative video task.

Dependent variable	AUC [Newton*s], video task		
	<i>b</i>	<i>SE</i>	<i>t</i>
<b>Fixed effects</b>			
(Intercept)	4.191	0.124	33.78
Language (Lg.)	0.035	0.236	0.15
Emotionality	1.580	0.102	<b>15.44</b>
Epoch	-	-	-
Luminance	-	-	-
Sex	0.724	0.245	<b>2.96</b>
Lg. × emotion.	-0.643	0.205	<b>-3.14</b>

Note. Absolute *t*-values > 1.96 are significant (in bold). Continuous predictors were standardized. (-) = variable not relevant for the model.

**Model comparisons for the narrative video task:** AUC (log-transformed) improved fit of the LMM predicting pupil dilation significantly beyond the null model,  $\chi^2(1) = 12.44$ ,  $p < .001$ , based on a positive association between pupil dilation and AUC,  $b = .018$ ,  $SE = .005$ ,  $t = 3.85$ .