

## Appendix A. Materials

**Table A1.** List of morphological, semantic, phonological and unrelated primes used in Experiment 1 and 2. Unrelated primes differed for Experiment 1 and 2. Note, that the verbs used for morphologically related primes were depicted as actions and served as target pictures.

| Morphological primes                    |        | Semantic primes (Exp. 1)                | Phonological primes (Exp. 1)  | Unrelated primes             |                                |
|-----------------------------------------|--------|-----------------------------------------|-------------------------------|------------------------------|--------------------------------|
|                                         |        |                                         |                               | Exp.1                        | Exp. 2                         |
| <i>jagen</i> ‘to hunt’ (Exp.1 & 2)      | Reg.   | <i>hetzen</i> ‘to chase’                | <i>jammern</i> ‘to complain’  | <i>klatschen</i> ‘to clap’   | <i>führen</i> ‘to lead’        |
| <i>kleben</i> ‘to glue’ (Exp.1 & 2)     | Reg.   | <i>schweißen</i> ‘to weld’              | <i>klettern</i> ‘to climb’    | <i>eilen</i> ‘to rush’       | <i>hindern</i> ‘to prevent’    |
| <i>drücken</i> ‘to press’ (Exp.1 & 2)   | Reg.   | <i>quetschen</i> ‘to squeeze’           | <i>drohen</i> ‘to threaten’   | <i>lutschen</i> ‘to suck’    | <i>klagen</i> ‘to sew’         |
| <i>wandern</i> ‘to hike’                | Reg.   | <i>pilgern</i> ‘to make a pilgrimage’   | <i>wanken</i> ‘to stumble’    | <i>sparen</i> ‘to save’      | <i>fehlen</i> ‘to lack’        |
| <i>spielen</i> ‘to play’ (Exp.1 & 2)    | Reg.   | <i>toben</i> ‘to frolic’                | <i>spucken</i> ‘to spit’      | <i>ordnen</i> ‘to sort’      | <i>drucken</i> ‘to print’      |
| <i>schenken</i> ‘to give’ (Exp.1 & 2)   | Reg.   | <i>spenden</i> ‘to donate’              | <i>scherzen</i> ‘to joke’     | <i>angeln</i> ‘to fish’      | <i>heulen</i> ‘to cry’         |
| <i>weinen</i> ‘to cry’ (Exp.1 & 2)      | Reg.   | <i>schluchzen</i> ‘to sob’              | <i>weilen</i> ‘to linger’     | <i>zünden</i> ‘to spark’     | <i>sparen</i> ‘to save’        |
| <i>zeigen</i> ‘to point’ (Exp.1 & 2)    | Reg.   | <i>deuten</i> ‘to point’                | <i>zerren</i> ‘to drag’       | <i>hindern</i> ‘to prevent’  | <i>kosten</i> ‘to cost’        |
| <i>rauchen</i> ‘to smoke’ (Exp.1 & 2)   | Reg.   | <i>dampfen</i> ‘to steam’               | <i>rauschen</i> ‘to swoosh’   | <i>stolpern</i> ‘to stumble’ | <i>glänzen</i> ‘to shine’      |
| <i>lachen</i> ‘to laugh’ (Exp.1 & 2)    | Reg.   | <i>schmunzeln</i> ‘to grin’             | <i>labern</i> ‘to babble’     |                              | <i>üben</i> ‘to practise’      |
| <i>rollen</i> ‘to roll’ (Exp.1 & 2)     | Reg.   | <i>kugeln</i> ‘to roll’                 | <i>rodeln</i> ‘to sled’       |                              | <i>peitschen</i> ‘to whip’     |
| <i>kehren</i> ‘to sweep’ (Exp.1 & 2)    | Reg.   | <i>putzen</i> ‘to clean’                | <i>keifen</i> ‘to pinch’      | <i>heucheln</i> ‘to pretend’ |                                |
| <i>klopfen</i> ‘to knock’ (Exp.1 & 2)   | Reg.   | <i>pochen</i> ‘to tap’                  | <i>klauen</i> ‘to steal’      | <i>dienen</i> ‘to serve’     |                                |
| <i>kochen</i> ‘to cook’ (Exp.1 & 2)     | Reg.   | <i>schmoren</i> ‘to stew’               | <i>kontern</i> ‘to reverse’   | <i>bellen</i> ‘to bark’      |                                |
| <i>tanzen</i> ‘to dance’ (Exp.1 & 2)    | Reg.   | <i>steppen</i> ‘to tap dance’           | <i>tarnen</i> ‘to disguise’   | <i>beichten</i> ‘to confess’ |                                |
| <i>tauchen</i> ‘to dive’ (Exp.1 & 2)    | Reg.   | <i>baden</i> ‘to take a bath’           | <i>tauschen</i> ‘to swap’     | <i>stören</i> ‘to disturb’   |                                |
| <i>bügeln</i> ‘to iron’ (Exp.2)         | Reg.   | –                                       | –                             |                              | <i>strafen</i> ‘to punish’     |
| <i>küssen</i> ‘to kiss’ (Exp.2)         | Reg.   | –                                       | –                             |                              | <i>heilen</i> ‘to heal’        |
| <i>baden</i> ‘to take a bath’ (Exp.2)   | Reg.   | –                                       | –                             |                              | <i>erben</i> ‘to inherit’      |
| <i>hacken</i> ‘to chop’ (Exp.2)         | Reg.   | –                                       | –                             |                              | <i>blitzen</i> ‘to flash’      |
| <i>klettern</i> ‘to climb’ (Exp.2)      | Reg.   | –                                       | –                             |                              | <i>bauen</i> ‘to build’        |
| <i>malen</i> ‘to paint’ (Exp.2)         | Reg.   | –                                       | –                             |                              | <i>heften</i> ‘to tack’        |
| <i>wählen</i> ‘to vote’ (Exp.2)         | Reg.   | –                                       | –                             |                              | <i>hoffen</i> ‘to hope’        |
| <i>spritzen</i> ‘to syringe’ (Exp.2)    | Reg.   | –                                       | –                             |                              | <i>melden</i> ‘to report’      |
| <i>backen</i> ‘to bake’ (Exp.1 & 2)     | Irr. 1 | <i>garen</i> ‘to cook’                  | <i>bangen</i> ‘to fear for’   |                              | <i>blitzen</i> ‘to flash’      |
| <i>blasen</i> ‘to blow’ (Exp.1 & 2)     | Irr. 1 | <i>prusten</i> ‘to snort with laughter’ | <i>rasen</i> ‘to speed’       |                              | <i>zittern</i> ‘to shiver’     |
| <i>braten</i> ‘to fry’ (Exp.1 & 2)      | Irr. 1 | <i>dünsten</i> ‘to steam’               | <i>brauchen</i> ‘to need’     |                              | <i>dehnen</i> ‘to stretch’     |
| <i>fahren</i> ‘to drive’ (Exp.1 & 2)    | Irr. 1 | <i>reisen</i> ‘to travel’               | <i>fallen</i> ‘to fold’       |                              | <i>sägen</i> ‘to saw’          |
| <i>fangen</i> ‘to catch’ (Exp.1 & 2)    | Irr. 1 | <i>schnappen</i> ‘to snap’              | <i>fasten</i> ‘to starve’     |                              | <i>husten</i> ‘to cough’       |
| <i>graben</i> ‘to dig’ (Exp.1 & 2)      | Irr. 1 | <i>buddeln</i> ‘to dig’                 | <i>grinsen</i> ‘to smirk’     |                              | <i>betteln</i> ‘to beg’        |
| <i>halten</i> ‘to hold’ (Exp.1 & 2)     | Irr. 1 | <i>klammern</i> ‘to cling’              | <i>hassen</i> ‘to hate’       |                              | <i>rächen</i> ‘to retaliate’   |
| <i>laufen</i> ‘to run’ (Exp.1 & 2)      | Irr. 1 | <i>spurten</i> ‘to dash’                | <i>lauern</i> ‘to lurk’       |                              | <i>motzen</i> ‘to grumble’     |
| <i>lesen</i> ‘to read’ (Exp.1 & 2)      | Irr. 1 | <i>schmökern</i> ‘to browse’            | <i>leben</i> ‘to live’        |                              | <i>bügeln</i> ‘to iron’        |
| <i>schlafen</i> ‘to sleep’ (Exp.1 & 2)  | Irr. 1 | <i>träumen</i> ‘to dream’               | <i>schlucken</i> ‘to swallow’ |                              | <i>prüfen</i> ‘to test’        |
| <i>schlagen</i> ‘to hit’ (Exp.1 & 2)    | Irr. 1 | <i>boxen</i> ‘to punch’                 | <i>klagen</i> ‘to lament’     |                              | <i>lenken</i> ‘to steer’       |
| <i>sehen</i> ‘to see’ (Exp.1 & 2)       | Irr. 1 | <i>gucken</i> ‘to peek’                 | <i>wehen</i> ‘to blow’        |                              | <i>kneten</i> ‘to knead’       |
| <i>stoßen</i> ‘to bump’ (Exp.1 & 2)     | Irr. 1 | <i>prellen</i> ‘to dupe’                | <i>stottern</i> ‘to stutter’  |                              | <i>kaufen</i> ‘to buy’         |
| <i>tragen</i> ‘to carry’ (Exp.1 & 2)    | Irr. 1 | <i>liefern</i> ‘to deliver’             | <i>tratschen</i> ‘to gossip’  |                              | <i>schnitzten</i> ‘to carve’   |
| <i>treten</i> ‘to kick’ (Exp.1 & 2)     | Irr. 1 | <i>strampeln</i> ‘to kick’              | <i>trennen</i> ‘to separate’  |                              | <i>saufen</i> ‘to booze’       |
| <i>waschen</i> ‘to wash’ (Exp.1 & 2)    | Irr. 1 | <i>spülen</i> ‘to rinse’                | <i>wachen</i> ‘to wake’       |                              | <i>kitzeln</i> ‘to tickle’     |
| <i>fallen</i> ‘to fall’ (Exp.2)         | Irr. 1 | –                                       | –                             | –                            | <i>wiegen</i> ‘to weigh’       |
| <i>fressen</i> ‘to eat’ (Exp.2)         | Irr. 1 | –                                       | –                             | –                            | <i>steigen</i> ‘to rise’       |
| <i>geben</i> ‘to give’ (Exp.2)          | Irr. 1 | –                                       | –                             | –                            | <i>hauen</i> ‘to beat’         |
| <i>messen</i> ‘to measure’ (Exp.2)      | Irr. 1 | –                                       | –                             | –                            | <i>laden</i> ‘to charge’       |
| <i>rufen</i> ‘to call’ (Exp.2)          | Irr. 1 | –                                       | –                             | –                            | <i>lassen</i> ‘to leave’       |
| <i>schneiden</i> ‘to cut’ (Exp.2)       | Irr. 1 | –                                       | –                             | –                            | <i>fließen</i> ‘to flow’       |
| <i>beißen</i> ‘to bite’ (Exp.1 & 2)     | Irr. 2 | <i>kauen</i> ‘to chew’                  | <i>beizen</i> ‘to stain’      | <i>schnattern</i> ‘to quack’ | <i>gären</i> ‘to ferment’      |
| <i>biegen</i> ‘to bend’ (Exp.1 & 2)     | Irr. 2 | <i>formen</i> ‘to shape’                | <i>siegen</i> ‘to win’        | <i>folgen</i> ‘to follow’    | <i>sitzen</i> ‘to sit’         |
| <i>finden</i> ‘to discover’ (Exp.1 & 2) | Irr. 2 | <i>sichten</i> ‘to sight’               | <i>filmen</i> ‘to film’       | <i>duften</i> ‘to smell’     | <i>schmeißen</i> ‘to throw’    |
| <i>fliegen</i> ‘to fly’ (Exp.1 & 2)     | Irr. 2 | <i>schweben</i> ‘to hover’              | <i>flücken</i> ‘to mend’      | <i>bohren</i> ‘to drill’     | <i>schreiten</i> ‘to step’     |
| <i>gießen</i> ‘to water’ (Exp.1 & 2)    | Irr. 2 | <i>regnen</i> ‘to rain’                 | <i>grüßen</i> ‘to greet’      |                              | <i>schmuggeln</i> ‘to smuggle’ |
| <i>heben</i> ‘to lift’ (Exp.1 & 2)      | Irr. 2 | <i>stemmen</i> ‘to lift’                | <i>hegen</i> ‘to tend’        |                              | <i>fauchen</i> ‘to hiss’       |
| <i>liegen</i> ‘to lie’ (Exp.1 & 2)      | Irr. 2 | <i>ruhen</i> ‘to rest’                  | <i>lieben</i> ‘to love’       |                              | <i>ernten</i> ‘to harvest’     |
| <i>pfeifen</i> ‘to whistle’ (Exp.1 & 2) | Irr. 2 | <i>flöten</i> ‘to whistle’              | <i>pflücken</i> ‘to pick’     |                              | <i>mieten</i> ‘to rent’        |
| <i>schießen</i> ‘to shoot’ (Exp.1 & 2)  | Irr. 2 | <i>feuern</i> ‘to fire’                 | <i>schicken</i> ‘to send’     |                              | <i>wechseln</i> ‘to change’    |
| <i>schreiben</i> ‘to write’ (Exp.1 & 2) | Irr. 2 | <i>tippen</i> ‘to type’                 | <i>schrauben</i> ‘to screw’   |                              | <i>niesen</i> ‘to sneeze’      |
| <i>schwimmen</i> ‘to swim’ (Exp.1 & 2)  | Irr. 2 | <i>krauln</i> ‘to swim the crawl’       | <i>stimmen</i> ‘to vote’      |                              | <i>picken</i> ‘to peck’        |
| <i>reiben</i> ‘to grind’ (Exp.1 & 2)    | Irr. 2 | <i>scheuern</i> ‘to scrub’              | <i>reimen</i> ‘to rhyme’      |                              | <i>schaden</i> ‘to damage’     |
| <i>reißen</i> ‘to tear’ (Exp.1 & 2)     | Irr. 2 | <i>platzen</i> ‘to burst’               | <i>reichen</i> ‘to suffice’   |                              | <i>fordern</i> ‘to demand’     |
| <i>reiten</i> ‘to ride’ (Exp.1 & 2)     | Irr. 2 | <i>traben</i> ‘to trot’                 | <i>reizen</i> ‘to tease’      |                              | <i>beten</i> ‘to pray’         |
| <i>ziehen</i> ‘to pull’ (Exp.1 & 2)     | Irr. 2 | <i>schleppen</i> ‘to drag’              | <i>zielen</i> ‘to aim’        |                              | <i>scheitern</i> ‘to fail’     |
| <i>streichen</i> ‘to paint’ (Exp.1 & 2) | Irr. 2 | <i>färben</i> ‘to dye’                  | <i>streiken</i> ‘to refuse’   |                              | <i>rufen</i> ‘to call’         |
| <i>binden</i> ‘to tie’ (Exp.2)          | Irr. 2 | –                                       | –                             | –                            | <i>gleiten</i> ‘to slide’      |
| <i>melken</i> ‘to milk’ (Exp.2)         | Irr. 2 | –                                       | –                             | –                            | <i>kneifen</i> ‘to pinch’      |
| <i>streiten</i> ‘to argue’ (Exp.2)      | Irr. 2 | –                                       | –                             | –                            | <i>quellen</i> ‘to soak’       |
| <i>singen</i> ‘to sing’ (Exp.2)         | Irr. 2 | –                                       | –                             | –                            | <i>schmelzen</i> ‘to melt’     |
| <i>trinken</i> ‘to drink’ (Exp.2)       | Irr. 2 | –                                       | –                             | –                            | <i>leihen</i> ‘to borrow’      |
| <i>schieben</i> ‘to push’ (Exp.2)       | Irr. 2 | –                                       | –                             | –                            | <i>ringen</i> ‘to wrestle’     |
| <i>helfen</i> ‘to help’ (Exp.2)         | Irr. 2 | –                                       | –                             | –                            | <i>preisen</i> ‘to commend’    |

**Table A2.** Final mean semantic relatedness for semantically, phonologically and unrelated prime-target pairs of Experiment 1.

| Relatedness    | Verb class of the target verb |                           |                           |
|----------------|-------------------------------|---------------------------|---------------------------|
|                | Regular ( <i>SE</i> )         | Irregular 1 ( <i>SE</i> ) | Irregular 2 ( <i>SE</i> ) |
| Semantically   | 4.8 ( <i>0.07</i> )           | 4.74 ( <i>0.08</i> )      | 4.61 ( <i>0.08</i> )      |
| Phonologically | 1.1 ( <i>0.02</i> )           | 1.07 ( <i>0.02</i> )      | 1.05 ( <i>0.01</i> )      |
| Unrelated      | 1.1 ( <i>0.01</i> )           | 1.15 ( <i>0.02</i> )      | 1.02 ( <i>0.01</i> )      |

Notes. SE = Standard error.

## Appendix B. Frequentist analyses

**Table B1.** Contrast matrix for linear mixed model 1 (Experiment 1).

| Condition               | Unrelated - Morph. | Unrelated - Phon. | Unrelated - Sem. |
|-------------------------|--------------------|-------------------|------------------|
| Morphologically related | -1                 | 0                 | 0                |
| Phonologically related  | 0                  | -1                | 0                |
| Semantically related    | 0                  | 0                 | -1               |
| Unrelated               | 1                  | 1                 | 1                |

Notes. Morph. = Morphologically related; Sem. = Semantically related; Phon. = Phonologically related.

**Table B2.** Contrast matrix for linear mixed model 2 (Experiment 2).

| Relatedness             | Unrelated - Morphologically related |
|-------------------------|-------------------------------------|
| Unrelated               | 1                                   |
| Morphologically related | -1                                  |

**Table B3.** Contrast matrix for linear mixed model 3 (Experiment 2).

| Condition           | Relatedness | Irr.2 –<br>Irr. 1 | Regular –<br>(Irr. 2 & Irr. 1) | Rel. ×<br>(Irr. 2 – Irr. 1 ) | Rel. ×<br>(Regular – (Irr. 2 & Irr.1)) |
|---------------------|-------------|-------------------|--------------------------------|------------------------------|----------------------------------------|
| Morph., Regular     | -1/3        | 0                 | 1/2                            | 0                            | -1/2                                   |
| Morph., Irregular 1 | -1/3        | -1/2              | -1/4                           | 1/2                          | 1/4                                    |
| Morph., Irregular 2 | -1/3        | 1/2               | -1/4                           | -1/2                         | 1/4                                    |
| Unrel., Regular     | 1/3         | 0                 | 1/2                            | 0                            | 1/2                                    |
| Unrel., Irregular 1 | 1/3         | -1/2              | -1/4                           | -1/2                         | -1/4                                   |
| Unrel., Irregular 2 | 1/3         | 1/2               | -1/4                           | 1/2                          | -1/4                                   |

Note. Irr.1 = Irregular 1 verbs; Irr.2 = Irregular 2 verbs; Reg. = Regular verbs; Morph. = Morphological relatedness; Unrel. = Unrelated.