

Supplementary TABLE 1: Summary of studies on valence effects in word processing.

Supplementary TABLE 1A: Summary of studies on valence effects in word processing in adults

ACC: Accuracy, RT: Reaction Times

Adv-pos/neg: behavioral advantage for stimuli with positive / negative valence

pos=neg: no significant difference between positive and negative stimuli.

Paper number	Authors	Participants	Method/Task	Language; Stimuli	Results	Valence effect Direction
1	Adelman & Estes (2013)	n=142 undergraduates from Cortese et al. (2010)	Memory task, Recognition memory scores by Cortese et al. (2010) merged with emotionality ratings from Adelman & Estes (2013) Analysis of influence of arousal and valence on memory of words	English; 2578 written positive, negative and neutral words	<ul style="list-style-type: none"> - Emotion words were remembered better than neutral words - No effect of valence on memory 	ACC: Pos = neg
2	Bayer et al. (2012)	n=24 (12 female), mean age = 23.1 years	EEG, Reading, Lexical Decision	German; Written words: 180 nouns taken from BAWL	<ul style="list-style-type: none"> - Negative words slower than neutral words - Negative words less accurate than positive and neutral words 	RT: Adv-pos Acc: Adv-pos
3	Citron et al. (2013)	n=31 (16 female), mean age= 24 years	EEG, Lexical Decision	English; Written words: 150 words, positive - negative - neutral, 150 non-words	<ul style="list-style-type: none"> - Positive and negative faster than neutral - Positive words more accurate than negative and neutral words - High arousal words more accurate than low arousal words 	RT: Pos=neg Acc: Adv-pos
4	Child et al. (2018)	n=36, mean age= 22 years	Reading	English; Written texts: 12positive, 12negative	- No difference in reading time of positive and negative texts	Reading time: Pos =neg
		n=80, mean age= 21 years	Reading + matching/ mismatching condition	English; Written texts: 12positive, 12negative, 12 with a match of implicit emotional content and explicit emotion word, 12 with mismatch of implicit emotional content and	- No difference in reading time of positive and negative texts	Reading time: Pos =neg

				explicit emotion term		
5	Dijksterhuis & Aarts (2003)	n=25	Word detection (Lexical Decision)	Dutch; Written words: 30 words, positive - negative - neutral	- Negative words detected more often than positive words	Acc: Adv-neg
		n=56	Emotional categorization: Positive vs. negative		- Negative words categorized more accurate than positive words	Acc: Adv-neg
		n=31	Emotional categorization: Positive vs. negative combined with synonymy decision		- Negative word categorized more accurate than positive words - Synonymy decision: positive as accurate as negative	Acc: Adv-neg Acc: Pos = neg
6	Estes & Verges (2008)	n=51	Lexical Decision	English; Written words: 40 words, positive - negative 40 non-words	- Positive words faster than negative words	RT: Adv-pos Acc: Pos = neg
		n=51	Valence Judgement		- Negative faster than positive	RT: Adv-neg Acc: Pos = neg
7	Ferré & Sanchez-Casas (2014)	n=57 (44 female), mean age =19.9 years	Lexical Decision, word-word Priming	Spanish; Written words: 48 concrete words positive-negative	- Positive words faster than negative - Semantic priming effect but no affective priming effect - Participants were faster when words were semantically related	RT: Adv-pos
		n=56 (52 female), mean age =20,3 years		Spanish; Written words: 48 abstract words positive-negative	- Positive words faster than negative - No semantic priming effect - Affective priming: faster reaction times when the valence is congruent	RT: Adv-pos
8	Goh et al. (2016)	n=40	Lexical Decision	English; audibly presented words: 514 concrete nouns 468 non-words	- Positive faster than negative - Faster RT for more concrete words and words with higher number of semantic features - Very negative and very positive faster than neutral - No effect of arousal	RT: Adv-pos

		n=40	Semantic Categorization: abstract vs. concrete		<ul style="list-style-type: none"> - Positive faster than negative - Faster RT for more concrete words and words with higher number of semantic features - Very negative and very positive faster than neutral - No effect of arousal 	RT: Adv-pos
9	Herbert et al. (2006)	n=26 (10 female), mean age = 26 years	EMG and EEG, Valence judgement, Memorization	German; Written words: 180 adjectives, pleasant-unpleasant-neutral	<ul style="list-style-type: none"> - EMG startle eye blink: blink facilitation for pleasant words 	ACC: Adv-pos
10	Herbert et al. (2008)	n= 16 (8 female), mean age = 27 years	EEG, Silent reading; surprise free recall task	German; Written words: 60 pleasant, 60 unpleasant, 60 neutral	<ul style="list-style-type: none"> - Recall accuracy: better recall for pleasant words than for neutral and unpleasant words 	Acc: Adv-pos
11	Hinojosa et al. (2010)	n=32 (28 female), mean age = 23 years	EEG, Word identification (identifying words among nonsense stimuli)	Spanish; Written words: 240 nouns, positive - negative - neutral 80 non-recognizable stimuli	<ul style="list-style-type: none"> - No valence effects 	RT: Pos = neg Acc: Pos = neg
			EEG, Word identification (Lexical decision)	Spanish; Written words: 240 nouns, positive - negative - neutral 80 non-words	<ul style="list-style-type: none"> - Fewer omissions of positive words than of negative and neutral words - Positive words faster than negative and neutral words 	RT: Adv-pos Acc: Adv-pos
12	Hofmann et al. (2009)	n=20 (16 female), mean age = 28 years	EEG, Lexical Decision	German; Written words: 200 nouns 200 non-words	<ul style="list-style-type: none"> - Positive faster than neutral - Only negative words with high arousal faster than neutral words - Positive more accurate than neutral - Only negative words with high arousal more accurate than neutral words - Positive and negative words of same arousal: positive words faster and more accurate - Advantage for positive and highly arousing 	RT: Adv-pos Acc: Adv-pos

					negative words, arousal not facilitative for positive words	
13	Imbir et al. (2016)	n=32 (15 female), mean age = 21,5	EEG, Lexical Decision	Polish; Written words: 135 nouns 135 pseudo-words	<ul style="list-style-type: none"> - Positive words more likely to be classified correctly than negative and neutral words - RT: no effect of valence 	Acc: Adv-pos RT: Pos = neg
14	Inaba et al. (2005)	n=16 (10 female), mean age = 22.3 years	EEG, Memorize-recognition task (old vs. new)	Japanese; Written words: 150 affective nouns, positive - negative - neutral	<ul style="list-style-type: none"> - Higher hit rate for positive and negative words than for neutral words - More false alarms for positive than for negative words - Correct responses for positive words faster than correct responses for negative and neutral words 	Acc Hit rate: pos = neg Acc False alarms: Adv-neg RT: Adv-pos
15	Itkes & Mashal (2016)	n=40 (23 female), mean age = 25.74 years	Semantic decision task	Hebrew; 32 written word pairs: comprising: one head noun and one modifier (positive or negative)	<ul style="list-style-type: none"> - More correct responses to negative words - Response times to negative word pairs were slower than those of positive word pairs 	ACC: Adv-neg RT: Adv-pos
				32 written word pairs: comprising: one head noun and one modifier (positive or negative and either incongruent or congruent with overall valence of the pair)	<ul style="list-style-type: none"> - No difference between positive and negative word pairs - Responses to negative incongruent word pairs were slower than those to positive incongruent word pairs 	ACC: pos=neg RT: Adv-pos
16	Kanske & Kotz (2007)	n=30 (15 female), mean age = 25.6 years	EEG, Lexical Decision	German; Written words: 240 nouns, positive-negative-neutral 240 non-words	<ul style="list-style-type: none"> - concrete words faster than abstract words - Positive and negative words faster than neutral words - Concrete positive words faster than concrete negative words 	RT: Adv-pos
17	Kappes & Bermeitinger (2016)	Younger adults: n=41 (32 female), mean age = 20.9 years,	Emotional Stroop Task	German; 96 written nouns: negative high arousing nouns, negative medium	<ul style="list-style-type: none"> - Faster responses for positive compared to negative words in younger adults 	Younger adults: RT: Adv-pos

		Older adults: n=39 (25 female), mean age = 69.2 years		arousing nouns, positive nouns, neutral nouns	<ul style="list-style-type: none"> - No differences in response times in older adults - No differences in error rates in both age groups 	Older adults: RT: pos=neg ACC: pos=neg
18	Kever et al. (2017)	n=60 (8 female), mean age = 20.8 years	Word Decision task (emotional vs non-emotional) in a low- and high- arousing condition	French; 66 written emotion related words, 32 positive, 32 negative, 32 neutral	<ul style="list-style-type: none"> - Positive words were faster recognized than negative and neutral words - Negative words were faster recognized than neutral words 	RT: Adv-pos
19	Kissler et al. (2009)	n=20 (10 female), mean age = 9 years	EEG, 1. silent reading 2. counting of adjectives 3. counting of nouns	German; Written words: 198 nouns and adjectives, positive- negative-neutral	<ul style="list-style-type: none"> - Better memorization of positive words than of negative and neutral words 	Acc: Adv-pos
20	Kousta et al. (2009)	n=79 (72 female), mean age = 19,5 years	Lexical Decision	English; Written words: 120 words, positive - negative - neutral 120 non-words	<ul style="list-style-type: none"> - Emotion words faster and more accurate than neutral words - No difference between positive and negative words 	RT: Pos = neg Acc: Pos = neg
21	Kuchinke et al. (2005)	n=20 (12 female), 20-36 years, mean age = 26.3	fMRI, Lexical Decision	German; Written words: 150 nouns positive - negative - neutral 150 non-words	<ul style="list-style-type: none"> - Positive faster than neutral and negative words - Positive more accurate than neutral words 	RT: Adv-pos Acc: Adv-pos
22	Kuchinke et al. (2007)	n=26 (16 female), 18-35 years, mean age = 24.1	Pupillary responses, Lexical Decision	German; Written words: 90 low frequency and 90 high frequency words, positive - negative - neutral 180 non-words	High frequency words: <ul style="list-style-type: none"> - Positive faster than neutral and negative words - accuracy: no difference between negative, positive and neutral Low frequency words: <ul style="list-style-type: none"> - Positive and negative words faster than neutral words - Positive more accurate than negative and neutral words 	RT (high freq.): Adv-pos Acc (high freq.): Pos = neg RT (low freq.): Pos = neg Acc (low freq.): Adv-pos

23	Kuperman et al. (2014)	Taken from Balota et al. (2007)	Statistical analyses based on existing databases	English; 12658 written words		
			Lexical Decision		<ul style="list-style-type: none"> - Positive words faster than negative words - Low-arousal words faster than high-arousal words 	RT: Adv-pos
			Naming		<ul style="list-style-type: none"> - Same tendencies but less strong 	RT: Adv-pos
24	Lee & Potter (2018)	n=55 (24 female), mean age= 21 years	Facial EMG & cardiac response measured as interbeat interval, Memory task (Forced choice, yes/no)	English; 16 altered radio advertisements with 2 positive, 2 negative, 2 neutral target words included	<ul style="list-style-type: none"> - Positive words were remembered more correctly than neutral words and negative words 	ACC: Adv-pos
25	Liu et al. (2016)	n=20 (10 female), mean age= 23,3 years	EEG, Emotional Categorization Task + Memory Task	Chinese Chengyu; 640 written words (traditional Chinese idiomatic expressions): 320 positive 320 negative	<ul style="list-style-type: none"> - More accurate and faster responses in categorization for positive words compared to negative words - Participants remembered more positive than negative words 	Categorization: ACC: Adv-pos RT: Adv-pos Recall: ACC Adv-pos
26	Madan et al. (2017)	n=39 (27 female), mean age= 19,9 years	Lexical Decision Free recall task	English; 4 written word lists of 40 words: 1 with highly arousing taboo words 1 with positive words 1 with negative words 1 with neutral words	Lexical decision: <ul style="list-style-type: none"> - No differences in RTs between positive and negative words - Greater RTs for taboo words compared to RTs for positive and neutral words, but no differences in RTs between taboo words and negative words - Greater RTs for negative words compared to neutral words Recall task: <ul style="list-style-type: none"> - Taboo words were better recalled than all other word types No differences between other word types	RT (Lexical decision): pos=neg ACC (recall): pos=neg
27	Martin & Altarriba (2017)	n=85 (41 female), mean age= 19 years	Lexical decision task with hemifield presentation of words	English; written words: 10 positive emotion words, 10 negative emotion words,	<ul style="list-style-type: none"> - Positive words faster than negative 	RT: Adv-pos

				10 positive emotion-laden words, 10 negative emotion-laden words, 40 neutral words		
28	Müller & Kuchinke (2016)	n=39 (34 female), mean age= 23.1 years	EEG, Electrooculogram, Lexical Decision	German; Written nouns: 25 happy 25 fear-related 25 neutral 75 nonwords	<ul style="list-style-type: none"> - Positive words were faster processed than fear-related and neutral words - No differences in processing speed between neutral and fear-related words - More errors for fear-related words compared to neutral and positive words - No differences between error rates of neutral and positive words 	RT: Adv-pos ACC: Adv-pos
29	Nasrallah & Carmel (2009)	n=27 (20 female), mean age= 26 years	Emotional categorization: Positive vs. negative	English; Written words: positive - negative - neutral	<ul style="list-style-type: none"> - Negative words more accurate than positive and neutral words 	Acc: Adv-neg
30	Palazova et al. (2011)	n=20 (13 female), mean age= 22.8 years	EEG, Lexical Decision	German; Written words: 180 words, positive - negative - neutral 180 pseudo-words	<ul style="list-style-type: none"> - Positive words faster than negative words, both faster than neutral words - positive and negative words more accurate than neutral words - high frequent words faster and more accurate than low frequent words - nouns faster and more accurate than adjectives and verbs - words faster and more accurate than pseudo-words 	RT: Adv-pos Acc: Pos = neg
31	Palazova et al. (2013)	n=42 (21 female), mean age= 24,1	EEG, Lexical Decision	German; 480 written words: - positive -negative - neutral 480 pseudo-words	<ul style="list-style-type: none"> - Neutral words faster than positive and negative words - Neutral and negative words more accurate than positive words 	RT: Pos = neg Acc: Adv-neg
32	Ponari et al. (2015)	n=95(60 female), mean age= 23,	Lexical Decision	English; Written words: 111 words,	<ul style="list-style-type: none"> - Overall: positive words faster than negative words, 	Overall: RT: Adv-pos

		native English speakers n=156 (125 female), English as second language, early vs. late L2		positive - negative - neutral 111 non-words	<ul style="list-style-type: none"> both faster than neutral words - Native + early L2: positive and negative words faster than neutral words, no difference between positive and negative - Late L2: Positive words faster than negative words, both faster than neutral words 	<p>Native + Early L2: Pos = neg</p> <p>Late L2: Adv-pos</p>
33	Rohr & Abdel Rahman (2018)	n=28 (24 female), mean age 22	EEG, Language production (translation) task + recall task	English; 126 written words, presented in 42 triplets (1 positive, 1 negative, 1 neutral word)	<ul style="list-style-type: none"> - Participants made more errors in producing the German translation of previously shown English negative words compared to neutral and positive words - No differences in error rates of positive and neutral words 	ACC: Adv-pos
34	Santaniello et al. (2018)	n=30 (21 female), age range 20 to 47 years, mean age = 25	EEG, Online recognition memory task	Spanish; 135 written nouns: 45 positive, 45 neutral 45 negative	<ul style="list-style-type: none"> - Faster reactions for negative words compared to positive words - Higher hit rates for negative words compared to positive and neutral words - More false alarms for positive words compared to negative and neutral words 	<p>ACC: Adv-neg</p> <p>RT: Adv-neg</p>
35	Scott et al. (2009)	n=26 (15 female), mean age=21	EEG, Lexical Decision	English; 240 written words: - positive -negative -neutral	<ul style="list-style-type: none"> - Positive and negative words faster than neutral - High frequent faster than low frequent words - Interaction of emotion and frequency - Low frequency: positive and negative words faster than neutral - High frequency: positive faster than negative and neutral 	<p>RT: Pos = neg</p> <p>RT: Adv-pos (for high frequent words)</p>
36	Scott et al. (2014)	n=24 (16 female),	Lexical Decision	English; 216 written words, - positive - negative - neutral	<ul style="list-style-type: none"> - Low frequency: no difference between positive and negative words - High frequency: positive faster 	<p>RT: Pos = neg</p> <p>RT: Adv-pos (for high frequent words)</p>

					than negative and neutral	
37	Stenberg et al. (1998)	n=50 (20 female), 20-34 years, mean age (median) = 26	Valence Decision	Swedish; 120 positive and negative words - superimposed on faces (5 angry, 5 happy, 3 neutral expressions)	- Positive faces were categorized faster than negative ones	RT: Adv-pos
38	Võ et al. (2006)	n=21 (13 female), 21-26 years, mean age = 21.45	Valence Decision	German; 60 written affective words: positive, negative neutral	- Positive faster than negative words - Negative words faster than neutral words	RT: Adv-pos
39	Yang et al. (2013)	n=16 (8 female), 21-26 years, mean age = 23.05	EEG, Word counting task (identify identical word stimuli in a row of words)	Chinese; Written words: 24 almost neutral, low and high positive words; 24 almost neutral, low and high negative words	- No effect of valence	RT: Pos = neg
40	Yao et al. (2016)	1. n=19 (10 female), mean age = 21.4 years, native Chinese speakers 2. n=20 (9 female), mean age = 22.3 years	EEG, Lexical Decision	Chinese; Written words: 80 concrete 80 abstract 120 pseudo-words	- Concrete words: positive words faster - No difference between high and low arousal - Abstract words: positive words with low arousal faster than high arousal - Negative: high arousal faster than low arousal	RT: Adv-pos
41	Yap & Seow (2013)	n=44	Lexical Decision Replication of Kousta et al. 2009 (see above)	Written words: (Stimuli identical to Kousta et al. 2009)	- Emotion words faster and more accurate than neutral words - No difference between positive and negative words	RT: Pos = neg Acc: Pos = neg
		n=52	go/no go Lexical Decision		- Emotion words faster and more accurate than neutral words - No difference between positive and negative words	RT: Pos = neg Acc: Pos = neg
42	Zhao et al. (2018)	n=18 (9 female), mean age = 20.8 years	EEG, dual-target rapid serial visual presentation task (Memory task)	Chinese; 18 written adjectives: 6 positive 6 negative 6 neutral	- Better presence determination of positive and negative words compared to neutral words - No difference in accuracy between	Acc: Pos = neg

	12 pseudo-words,	positive and negative words
	4 strings of four repeated digits	

Supplementary TABLE 1B: Summary of studies on valence effects in word processing in children

ACC: Accuracy, RT: Reaction Times

Adv-pos/neg: behavioral advantage for stimuli with positive / negative valence

pos=neg: no significant difference between positive and negative stimuli.

Paper number	Authors	Participants	Method/Task	Language; Stimuli	Results	Valence effect Direction
1	Bahn et al. (2017)	n in total = 120 5-, 6-, 9-, 12-year-olds and adults, each group: n=24 (12 female)	Lexical Decision	German; 48 audibly presented emotion words: 24 positive, 24 negative For lexical decision (additionally): 48 audibly presented concrete neutral words 96 audibly presented pseudo-words All words were recorded with a non-emotional neutral tone	<ul style="list-style-type: none"> - More correct reactions for positive compared to neutral and negative words in 5- and 6-year-olds - No effect of valence in accuracy in 9- and 12-year-olds and adults - Faster reaction times for negative words in 6-year-olds - No effect of valence in reaction times in all other age groups 	ACC: Adv-pos in 5- & 6-year-olds Pos = neg in 9- & 12-year-olds & adults RT: Adv-neg in 6-year-olds Pos=neg in 5-, 9-, 12-year-olds & adults
			Emotional Categorization		see Table 1 (main text)	see Table 1 (main text)
2	Pérez-Edgar & Fox (2007)	n=65 (29 female), 7 years	EEG, Auditory attention task	English; 60 audibly presented words repeated 3 times from 5 categories: high positive rating, low social rating; low positive, low social; high positive, high social; low positive, high social; neutral in both	<ul style="list-style-type: none"> - Positive words faster than negative words 	RT: Adv-pos
3	Ponari et al. (2018)	n=60(34 female), 6-12 years, mean age = 8.09	Lexical Decision	English; 24 audibly presented concrete words: 7 positive	Abstract words: <ul style="list-style-type: none"> - Positive-neutral comparison: - 8- to 9-year-olds recognized 	Abstract words: ACC: Pos = neg Concrete words: ACC: Pos = neg

		divided in three age groups: 6-7 years; 8-9 years; 10-11 years		<p>7negative 7neutral</p> <p>24audibly presented abstract words: 7positive 7negative 7neutral</p>	<p>positive words better than neutral words</p> <ul style="list-style-type: none"> - no differences in 6- to7-year-olds and 10-to 11-year-olds - Negative-neutral comparison: - no differences in all age groups - Negative-positive comparison: - no differences in all age groups <p>concrete words (in all age groups):</p> <ul style="list-style-type: none"> - Positive-Neutral comparison: - Neutral words were better recognized than positive words - Negative-Neutral comparison: - Neutral words were better recognized than negative words - Positive-Negative comparison: - No differences 	
4	Quas et al. (2016)	<p>n=83 (43 female), 7 to 8 years, mean age = 7.96, and</p> <p>n= 85 (44 female), 12 to 14 years, mean age = 13.46</p>	Memory task	<p>English; 180 audibly presented words: 60 positive 60 negative 60 neutral</p>	<ul style="list-style-type: none"> - Adolescents: Higher number of correctly recalled negative words compared to positive words - Children: No effect of valence on accuracy in recall 	<p>ACC Adolescents: Adv-neg</p> <p>ACC Children: Pos = neg</p>
5	Salehi et al. (2018)	n=10 (3 female), 9 years	EEG, Loud Reading	<p>Farsi 120 written words: 40 positive 40 negative 40 neutral</p>	<ul style="list-style-type: none"> - More correct reactions for positive words, compared to negative words - No differences between positive and neutral words and between neutral and negative words 	<p>ACC: Adv-pos RT: Pos = neg</p>
6	Silk et al. (2009)	n=64 (39 female), 8.1 to 17.9 years, mean age = 13.2	measure of pupillary reactivity, Valence Decision	<p>English; 66 written words positive negative neutral</p>	<ul style="list-style-type: none"> - No effect of valence 	<p>RT: Pos = neg</p>

7	Sylvester et al. (2016)	n=47 (17 female), 9-12 years, mean age = 10.3	Valence Decision	German; 90 written affective words: - positive - negative - neutral	<ul style="list-style-type: none"> - Positive faster than negative - Negative faster than neutral - Most correct responses for positive words 	RT: Adv-pos
8	Vermeulen et al. (2017)	n=386 (212 female), 9-11 years, mean age = 10.5	Memory task	Dutch; Two written word sets of 30 words: 10 positive 10 negative 10 neutral	<ul style="list-style-type: none"> - Higher number of correctly recalled neutral and positive words, compared to negative words - No differences between positive and neutral words 	ACC Adv-pos
9	Zhang et al. (2018)	n=90, 7 to 8 years, mean age = 7.50, n=90, 11 to 12 years, mean age = 11.40 n=90, mean age = 20.37	Memory task	English; 120 audibly presented words: 40 positive 40 negative 40 neutral	<ul style="list-style-type: none"> - Neutral words were recalled better than negative and positive words - Negative words were recalled better than positive words 	ACC Adv-neg

Missing details about the participants' age and gender breakdown (see column 'participants') are due to missing information in the relevant publication.