

# Supplementary Material for ‘Emotions are Perceived Differently from Posed and Spontaneous Facial Expressions’

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## Supplementary Text

### 1. Within-Cultural Recognition Rates

#### *Study 1: Dutch Sample*

In order to test whether both posed and spontaneous expressions would be recognised more accurately than expected by chance alone, we first calculated the proportion of times each unique video was accurately recognised when presented to participants, and then arcsine transformed the proportion to bring the data closer to a normal distribution. We then compared this recognition accuracy measure to chance level, which we set to  $1/8 = 0.125$  and arcsine transformed ( $\arcsine(\text{square root}(0.125)) = 0.36$ ). Note that we determined chance level across all eight emotions, rather than within valence, because confusion also occurs across emotions that are differently valenced.

To test whether the eight emotions (anger, disgust, fear, sadness, joy, compassion, love, and pride) could be recognised above chance level, we performed 16 one-sample one-sided t-tests comparing the recognition accuracy of each emotion to chance level, separately for each expression type (posed and spontaneous). We corrected for multiple comparisons using the Bonferroni-Holm method. We found that posed expressions of all the emotions except love were recognised above chance level. For spontaneous expressions, only compassion, joy, and pride were recognised better than chance. See *Table S2* for the test statistics and *Figure S1a* for the distribution of recognition accuracy for each emotion.

As such, almost all posed expressions and 3 of the 8 spontaneous expressions were recognised beyond rates expected by chance alone. For the full raw recognition rates, see the confusion matrices in *Tables S3* (posed stimuli) and *S4* (spontaneous stimuli).

#### *Study 2: Chinese Sample*

To test whether Chinese participants were able to recognise the eight emotions, we again calculated the proportion of times each unique video was accurately recognised when presented to participants. We then compared the arcsine transformed recognition rate to chance level, using one sample one-sided t-tests for posed and spontaneous emotion expressions separately. We corrected for multiple comparisons using the Bonferroni-Holm method. For posed expressions, recognition accuracy was significantly higher than chance level for all emotions except love. For spontaneous expressions, recognition accuracy was significantly above chance only for joy and compassion. See *Table S2* for the statistics and *Figure S1b* for the distribution of recognition accuracy for each emotion. For the full raw recognition rates, see the confusion matrices in *Tables S5* (posed) and *S6* (spontaneous).

### 2. Alternative Analysis of Within-Cultural Recognition Using Unbiased Hit Rates

We hypothesised that within-cultural emotions would be recognised more accurately from posed facial expressions than spontaneous. In the main manuscript, we tested this prediction with mixed effects logistic regressions, using a generalised linear mixed model fit by maximum likelihood. However, because previous research on emotion recognition has often used unbiased hit rates (Wagner, 1993) as the outcome variable, we pre-registered and performed conceptually equivalent analyses using unbiased hit rates too. An unbiased hit rate is the joint probability both that a stimulus is correctly identified (given that it is presented) and that a response is correctly used (given that it is used), and can be formalised as:

$$\frac{(\text{number of times an emotion was correctly identified})^2}{(\text{number of times emotion was presented}) * (\text{number of times emotion was selected as response})}$$

We calculated an unbiased hit rate for each participant per emotion category and expression type: these numbers capture how accurately participants identified stimuli, taking their guessing patterns and response tendencies into account. We then split the data into two (based on perceiver culture) and regressed unbiased hit rates onto expression type and emotion. The results of these analyses are summarised in *Table S7*, and show a Type x Emotion interaction for both Dutch and Chinese perceivers.

We followed up these interactions using paired sample one-sided t-tests (adjusted for multiple comparisons using a Bonferroni-Holm correction) comparing unbiased hit rates of posed emotions to their spontaneous counterparts. For all emotions in the two within-cultural studies, posed expressions were better recognised than spontaneous. These results are visualised in *Table S8*.

### 3. Results including low-performing participants

For Study 3 in the main manuscript, we preregistered the exclusion of participants whose overall performance was at least two standard deviations below the average for either posed or spontaneous stimuli. This criterion may be confounded with the results we report, since task performance is also the primary dependent variable in many analyses. To ensure that our findings were not explained by these exclusions, we re-ran all models using the final sample, plus data from poor-performers. We summarise these results below; we found no deviations from the results reported in the main manuscript.

#### *Study 3. Cross-Cultural Sample*

We first performed a mixed logistic regression with Recognition Accuracy as the binary outcome variable, and Stimulus Culture, Perceiver Culture, and Expression Type as fixed effects. We included Perceiver ID as a random effect. We found significant main effects of Expression Type ( $\chi(1) = 33.72, p < .0001$ ), Stimulus Culture ( $\chi(1) = 12.57, p < .001$ ), and Perceiver Culture ( $\chi(1) = 84.12, p < .0001$ ), as well as significant interactions between Expression Type and Stimulus Culture ( $\chi(1) = 18.04, p < .0001$ ) and Expression Type and Perceiver Culture ( $\chi(1) = 7.65, p = 0.006$ ).

*Emotions were identified more accurately from posed facial expressions than spontaneous facial expressions.*

In a logistic mixed effects model with Expression Type as a fixed factor, posed expressions (set as the intercept) were recognised more accurately than spontaneous expressions ( $OR_{spontaneous} = 0.64, 95\% \text{ CI } [0.62, 0.66], p < .0001$ ).

For Dutch perceivers, posed expressions were better recognised than spontaneous expressions for both Dutch ( $OR_{spontaneous} = 0.62, 95\% \text{ CI } [0.59, 0.66], p < .0001$ ) and Chinese stimuli ( $OR_{spontaneous} = 0.60, 95\% \text{ CI } [0.57, 0.63], p < .0001$ ). Chinese perceivers showed the same pattern: they were also better at recognising posed than spontaneous expressions for both Dutch ( $OR_{spontaneous} = 0.72, 95\% \text{ CI } [0.68, 0.76], p < .0001$ ) and Chinese stimuli ( $OR_{spontaneous} = 0.63, 95\% \text{ CI } [0.60, 0.67], p < .0001$ ).

*Negative emotions were better recognised than positive emotions from posed expressions, while positive emotions were better recognised from spontaneous expressions.*

When perceivers judged expressions produced by individuals from their own culture, main effects of Expression Type ( $\chi(1) = 562.91, p < .0001$ ) and Valence ( $\chi(1) = 32.58, p < .0001$ ) emerged, as well as an interaction effect between Valence and Expression Type ( $\chi(1) = 125.32, p < .0001$ ). Follow-up tests with negative valence set as the reference category indicated that, as in Studies 1 and 2, negative emotions ( $OR_{intercept} = 0.53, 95\% \text{ CI } [0.51, 0.55], p < .0001$ ) were more accurately recognised than positive emotions ( $OR_{positive} = 0.85, 95\% \text{ CI } [0.81, 0.90], p < .0001$ ) from posed expressions. This effect was reversed for spontaneous expressions: positive emotions ( $OR_{positive} = 1.35, 95\% \text{ CI } [1.27, 1.43], p < .0001$ ) were more accurately recognised than negative emotions ( $OR_{intercept} = 0.27, 95\% \text{ CI } [0.26, 0.28], p < .0001$ ) from spontaneous expressions.

When perceivers judged expressions produced by individuals from the other culture, we found a main effect of Expression Type ( $\chi(1) = 350.44, p < .0001$ ), and an interaction effect between Valence and Expression Type ( $\chi(1) = 35.68, p < .0001$ ). For posed expressions, negative emotions ( $OR_{intercept} = 0.47, 95\% \text{ CI } [0.44, 0.49], p < .0001$ ) were better recognised than positive emotions ( $OR_{positive} = 0.95, 95\% \text{ CI } [0.90, 1.01], p = 0.1$ ), though this effect did not reach statistical significance. On the other hand, for spontaneous expressions, positive emotions ( $OR_{positive} = 1.22, 95\% \text{ CI } [1.15, 1.30], p < .0001$ ), were recognised significantly more accurately than negative emotions ( $OR_{intercept} = 0.28, 95\% \text{ CI } [0.26, 0.29], p < .0001$ ).

#### 4. Cross-Cultural Recognition Rates

Before testing our preregistered hypotheses, we first attempted to replicate the results from Studies 1 and 2 with the new data, by comparing the arcsine transformed mean proportion of recognition rates per emotion and expression type to chance level, or  $\arcsine(\text{square root}(0.125)) = 0.36$ . We then performed 64 one-sample one-sided t-tests (2 perceiver cultures x 2 stimulus cultures x 8 emotions x 2 expression types) to compare recognition accuracy to chance level. We corrected for multiple comparisons using the Bonferroni-Holm method.

The full results of the tests are reported in *Table S9* (Dutch perceivers) and *Table S10* (Chinese perceivers). As expected based on the video selection procedure for Study 3, within-cultural recognition rates were on average higher than in Studies 1 and 2. Dutch perceivers recognised posed expressions of all emotions, regardless of stimulus culture, with the exception of love posed by Chinese expressers (estimate = 0.47,  $p = 0.05$ ). Recognition accuracy was also higher for spontaneous expressions, with Dutch perceivers recognising all but spontaneous expressions of fear and love by other Dutch expressers, and all but anger, disgust and love from the Chinese stimuli.

As in Study 2, Chinese perceivers recognised all posed expressions from their own culture except for love. They performed worse with Dutch stimuli, and recognised only posed expressions of anger, compassion, disgust, joy and sadness. Chinese perceivers performed better on within-cultural spontaneous expressions than they did in Study 2: spontaneous Chinese expressions of compassion, joy and sadness were recognised above chance-level. Chinese perceivers also recognised spontaneous Dutch expressions of anger, compassion, joy and sadness.

To fully replicate the analyses conducted in Studies 1 & 2, we also compared the recognition rates for posed and spontaneous versions of each emotion expression using logistic regressions. The results of these analyses are reported in *Table S11* and *Table S12*. The within-culture results from Studies 1 & 2 mostly replicated, with a couple of notable deviations. Dutch perceivers performed significantly better on posed versions of all emotions except pride, where there was no significant difference, and compassion, where the expected pattern was reversed (spontaneous > posed). Chinese perceivers performed better on posed versions of all emotions except compassion, where there was no significant difference. These differences are likely partially explained by the subset of stimuli selected for Study 3, since we excluded stimuli that were not well recognised in the first two studies. The reversed pattern observed in the Dutch sample when viewing compassionate expressions could also be interpreted within the context of the Type x Valence interaction we report throughout the paper: positive emotions (such as compassion) are better recognised than negative expressions when the expression is spontaneously elicited.

For the full (raw) recognition rates, see the confusion matrices in *Tables S13-S20*.

#### 5. Alternative Analysis of Cross-Cultural Recognition Using Unbiased Hit Rates

In Study 3, we hypothesised that emotions would be recognised more accurately from posed as compared to spontaneous facial expressions, even in a cross-cultural context. In the main manuscript, we tested this prediction with a mixed effects logistic regression using the generalised linear mixed model fit by maximum likelihood. Here, we test this prediction using unbiased hit rates, as described in Supplementary Text 2. We first created a new variable to capture cultural congruency that was equal to 1 if the participant's and stimulus' culture were the same, and 0 if not. We then calculated unbiased hit rates for each participant per emotion category, expression type, and level of cultural congruency. Finally, we regressed unbiased hit rates onto expression type, emotion, and cultural congruency. The results of these analyses are summarised in *Table S21*, and show a Type x Emotion x Congruency interaction.

We followed up this interaction using paired sample one-sided t-tests (adjusted for multiple comparisons using a Bonferroni-Holm correction) comparing unbiased hit rates of posed emotions to their spontaneous counterparts, for each combination of participant and stimulus culture. These results are visualised in *Table S22*.

Note that in Study 3, each participant only saw two videos per combination of Stimulus Culture x Emotion x Expression Type. This limits the variance per category for raw accuracy rates and unbiased hit rates. For this reason, the results reported in this section should be interpreted with caution: they are less sensitive than those reported in the manuscript.

## 6. Intensity of Emotions Reported by Expressers

To elicit spontaneous expressions, we video recorded expressers as they recalled events in their life in which they had experienced the target emotion. Expressers were asked to re-tell their emotional experience as clearly and in as much detail as possible so that someone else could understand exactly how they had felt. Participants rated how intensely they experienced the target emotion on a scale of 0-10, both during the actual experience and during recall.

Unsurprisingly, both Dutch ( $\beta_{intercept} = 7.96$ ,  $\beta_{recall} = -2.35$ ,  $p < .0001$ ) and Chinese ( $\beta_{intercept} = 8.40$ ,  $\beta_{recall} = -1.67$ ,  $p < .0001$ ) expressers reported experiencing the target emotions more intensely during the actual experience (which we set as the intercept), compared to recall.

Regressing the reported intensity of the target emotion onto time (during the experience vs. during recall) and valence (positive vs. negative emotions) revealed an interaction effect for both Dutch and Chinese expressers ( $ps < 0.001$ ). For both expresser cultures, negative and positive emotions were experienced similarly intensely during the actual experience ( $ps > 0.05$ ). However, at recall, both Dutch ( $M_{positive} = 6.54$ ,  $M_{negative} = 4.68$ ) and Chinese ( $M_{positive} = 7.34$ ,  $M_{negative} = 6.11$ ) expressers experienced positive emotions more intensely than negative emotions ( $ps < 0.001$ ).

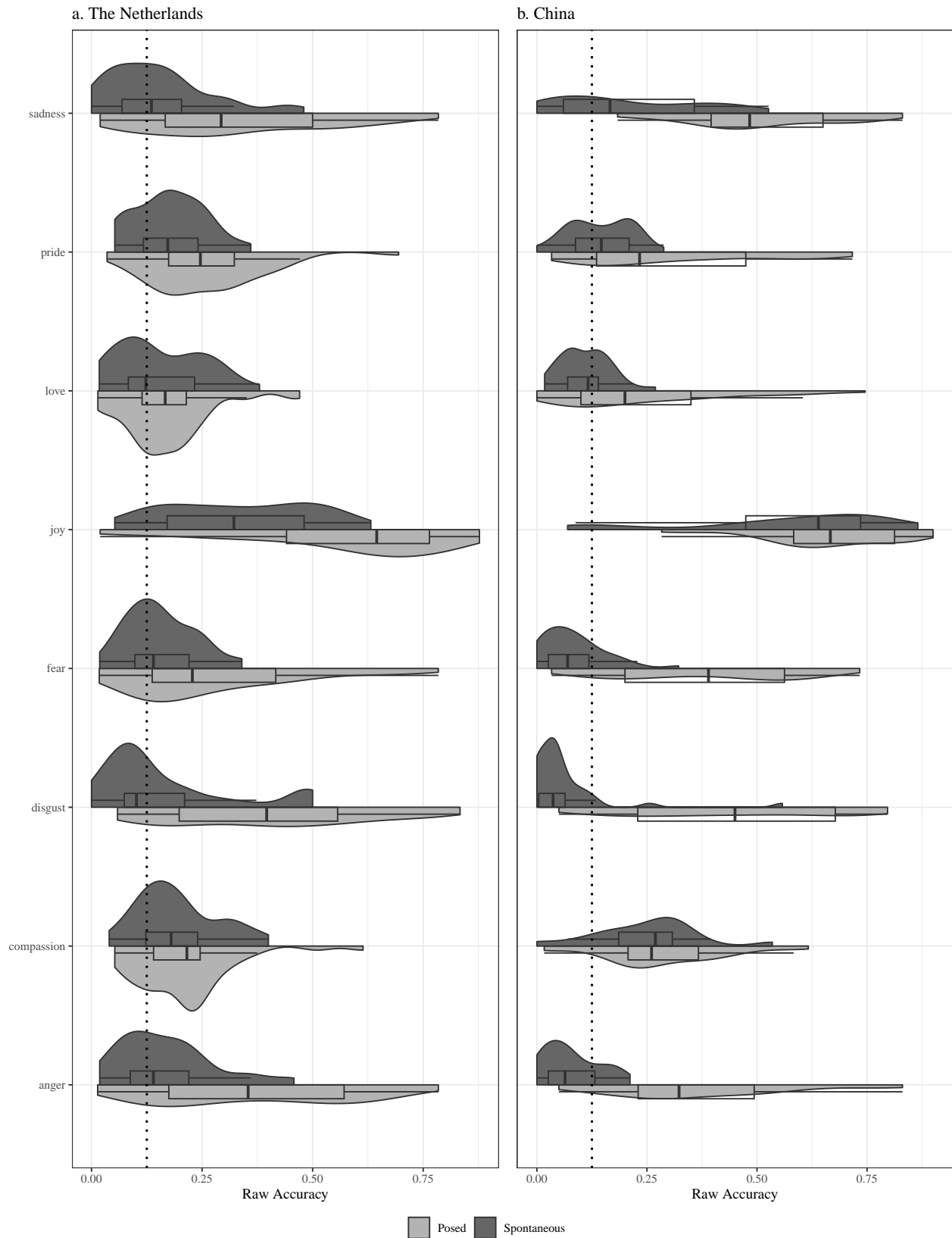


Figure S1: Recognition accuracy of posed and spontaneous expressions of eight emotions in the Netherlands (a) and China (b). All stimuli featured expressers from the same culture as the participants. Here, we have plotted recognition accuracy as the proportion of times each video in the stimuli set was correctly identified. The dotted line indicates chance level recognition ( $1/8 = 0.125$ ).

Expresser Culture	Type	Emotion	n (Study 1 and 2)	n (Study 3)
NL	posed	anger	40	35
		compassion	41	32
		disgust	40	34
		fear	41	34
		joy	40	37
		love	43	30
		pride	40	35
	spontaneous	sadness	40	30
		anger	41	26
		compassion	41	30
		disgust	43	17
		fear	40	24
		joy	43	39
		love	39	19
CN	posed	pride	40	29
		sadness	43	23
		anger	36	33
		compassion	36	33
		disgust	37	33
		fear	37	31
		joy	37	37
	spontaneous	love	37	22
		pride	37	29
		sadness	37	37
		anger	38	9
		compassion	37	32
		disgust	38	3
		fear	38	8
NL	spontaneous	joy	38	34
		love	37	16
		pride	38	21
		sadness	38	24

Table S1: Number of videos per Emotion x Expression Type category featured in all three studies.

Perceiver and Stimulus culture	Emotion	Type	Estimate	Statistic	P value	Adjusted P Value	
NL	anger	posed	0.63	6.87	< .0001	< <b>.0001</b>	
		spontaneous	0.41	2.01	= 0.03	= 0.28	
	compassion	posed	0.47	5.10	< .0001	< <b>.001</b>	
		spontaneous	0.45	4.64	< .0001	< <b>.001</b>	
	disgust	posed	0.68	7.69	< .0001	< <b>.0001</b>	
		spontaneous	0.39	0.85	= 0.2	= 1	
	fear	posed	0.54	4.95	< .0001	< <b>.001</b>	
		spontaneous	0.40	1.97	= 0.03	= 0.28	
	joy	posed	0.85	11.81	< .0001	< <b>.0001</b>	
		spontaneous	0.60	8.47	< .0001	< <b>.0001</b>	
	love	posed	0.41	2.35	= 0.01	= 0.14	
		spontaneous	0.39	1.15	= 0.13	= 1	
	pride	posed	0.52	6.63	< .0001	< <b>.0001</b>	
		spontaneous	0.42	3.64	< .001	= <b>0.005</b>	
	sadness	posed	0.59	5.85	< .0001	< <b>.0001</b>	
		spontaneous	0.37	0.50	= 0.31	= 1	
	CN	anger	posed	0.64	7.44	< .0001	< <b>.0001</b>
			spontaneous	0.25	-4.82	= 1	= 1
compassion		posed	0.55	6.49	< .0001	< <b>.0001</b>	
		spontaneous	0.50	5.06	< .0001	< <b>.001</b>	
disgust		posed	0.71	8.01	< .0001	< <b>.0001</b>	
		spontaneous	0.20	-6.06	= 1	= 1	
fear		posed	0.65	7.55	< .0001	< <b>.0001</b>	
		spontaneous	0.26	-4.29	= 1	= 1	
joy		posed	0.96	21.90	< .0001	< <b>.0001</b>	
		spontaneous	0.85	11.43	< .0001	< <b>.0001</b>	
love		posed	0.47	2.81	= 0.004	= 0.05	
		spontaneous	0.33	-2.06	= 0.98	= 1	
pride		posed	0.57	5.30	< .0001	< <b>.001</b>	
		spontaneous	0.38	0.72	= 0.24	= 1	
sadness		posed	0.80	14.74	< .0001	< <b>.0001</b>	
		spontaneous	0.43	1.92	= 0.03	= 0.28	

*Table S2: One-sided t-tests comparing within-cultural recognition accuracy per emotion and type to chance level.* We calculated recognition accuracy as an arcsine transformed proportion for each video in the stimuli set and compared this to arcsine transformed chance level (0.36). In both samples, all posed emotion expressions except love were recognised above chance level. For the spontaneous expressions of the same emotions, only compassion and joy were consistently recognised in both samples. The Dutch sample also recognised spontaneous expressions of pride.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.37</u></b>	0.11	0.19	0.10	0.05	0.04	0.04	0.11
compassion	0.14	<u>0.21</u>	0.15	0.13	0.05	0.04	0.05	<b>0.22</b>
disgust	0.12	0.10	<b><u>0.41</u></b>	0.11	0.08	0.05	0.05	0.08
fear	0.11	0.14	0.17	<b><u>0.28</u></b>	0.08	0.06	0.07	0.08
joy	0.03	0.04	0.03	0.04	<b><u>0.57</u></b>	0.09	0.16	0.03
love	0.06	0.11	0.05	0.07	<b>0.28</b>	<u>0.17</u>	0.21	0.04
pride	0.04	0.09	0.04	0.07	<b>0.34</b>	0.14	<u>0.26</u>	0.03
sadness	0.13	0.16	0.13	0.13	0.04	0.05	0.04	<b><u>0.34</u></b>

*Table S3: Study 1.* Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge within-cultural posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.17</u></b>	0.16	0.14	0.15	0.09	0.08	0.12	0.09
compassion	0.13	<b><u>0.19</u></b>	0.11	0.16	0.08	0.08	0.12	0.13
disgust	0.13	0.12	<b><u>0.17</u></b>	0.12	0.16	0.09	0.13	0.09
fear	0.13	<b>0.16</b>	0.11	<b><u>0.16</u></b>	0.10	0.09	0.14	0.10
joy	0.07	0.09	0.05	0.08	<b><u>0.34</u></b>	0.14	0.20	0.04
love	0.07	0.14	0.06	0.09	<b>0.27</b>	<u>0.15</u>	0.18	0.06
pride	0.09	0.13	0.06	0.09	<b>0.26</b>	0.13	<u>0.18</u>	0.06
sadness	0.11	<b>0.18</b>	0.11	0.15	0.09	0.09	0.11	<u>0.15</u>

*Table S4: Study 1.* Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge within-cultural spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.37</u></b>	0.14	0.10	0.09	0.06	0.03	0.06	0.15
compassion	0.12	<b><u>0.29</u></b>	0.06	0.08	0.06	0.04	0.05	<b>0.30</b>
disgust	0.10	0.09	<b><u>0.44</u></b>	0.08	0.09	0.03	0.03	0.13
fear	0.10	0.13	0.10	<b><u>0.38</u></b>	0.10	0.04	0.06	0.09
joy	0.02	0.04	0.02	0.03	<b><u>0.67</u></b>	0.08	0.13	0.02
love	0.06	0.16	0.03	0.05	<b>0.30</b>	<u>0.24</u>	0.11	0.05
pride	0.07	0.12	0.03	0.04	<b>0.31</b>	0.06	<b><u>0.31</u></b>	0.05
sadness	0.11	0.15	0.05	0.08	0.04	0.03	0.03	<b><u>0.52</u></b>

*Table S5: Study 2.* Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge within-cultural posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<u>0.08</u>	<b>0.22</b>	0.05	0.08	0.20	0.08	0.15	0.14
compassion	0.10	<b><u>0.25</u></b>	0.05	0.09	0.16	0.08	0.13	0.14
disgust	0.08	0.18	<u>0.06</u>	0.06	<b>0.32</b>	0.07	0.12	0.11
fear	0.07	0.20	0.03	<u>0.09</u>	<b>0.27</b>	0.09	0.14	0.12
joy	0.03	0.09	0.02	0.04	<b><u>0.56</u></b>	0.09	0.13	0.05
love	0.04	0.14	0.02	0.05	<b>0.41</b>	<u>0.11</u>	0.15	0.08
pride	0.03	0.14	0.02	0.05	<b>0.45</b>	0.09	<u>0.15</u>	0.06
sadness	0.07	<b>0.23</b>	0.04	0.10	0.18	0.08	0.10	<u>0.20</u>

*Table S6: Study 2.* Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge within-cultural spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Perceiver culture	Term	Sum of Squares	Mean Square	Numerator Df	Denominator Df	F Value	p Value
NL	type	5.19	5.19	1.00	468.00	284.91	< <b>.0001</b>
	emotion	14.81	2.12	7.00	3276.00	116.22	< <b>.0001</b>
	type:emotion	3.81	0.54	7.00	3276.00	29.89	< <b>.0001</b>
CN	type	11.10	11.10	1.00	436.00	525.15	< <b>.0001</b>
	emotion	18.90	2.70	7.00	3052.00	127.66	< <b>.0001</b>
	type:emotion	8.18	1.17	7.00	3052.00	55.25	< <b>.0001</b>

*Table S7: Alternative test of the effect of expression type (posed vs. spontaneous) and emotion using unbiased hit rates.*

An unbiased hit rate (Wagner, 1993) is the joint probability both that a stimulus is correctly identified (given that it is presented) and that a response is correctly used (given that it is used). Each participant has one unbiased hit rate calculated per emotion category and expression type: these numbers capture how accurately participants identified stimuli, taking that participants' guessing patterns into account. For these analyses, we split the data into two (based on perceiver culture) and then regressed unbiased hit rates onto expression type and emotion.

Perceiver culture	Emotion	Estimated Difference	Statistic	P value	Adjusted P Value
NL	anger	0.22	14.14	< .0001	< <b>.0001</b>
	compassion	0.04	3.87	< .0001	< <b>.001</b>
	disgust	0.20	12.97	< .0001	< <b>.0001</b>
	fear	0.16	11.17	< .0001	< <b>.0001</b>
	joy	0.20	12.54	< .0001	< <b>.0001</b>
	love	0.06	4.33	< .0001	< <b>.0001</b>
	pride	0.11	8.57	< .0001	< <b>.0001</b>
	sadness	0.18	12.45	< .0001	< <b>.0001</b>
CN	anger	0.31	19.43	< .0001	< <b>.0001</b>
	compassion	0.08	5.58	< .0001	< <b>.0001</b>
	disgust	0.42	20.87	< .0001	< <b>.0001</b>
	fear	0.34	19.17	< .0001	< <b>.0001</b>
	joy	0.20	11.46	< .0001	< <b>.0001</b>
	love	0.21	12.39	< .0001	< <b>.0001</b>
	pride	0.24	14.67	< .0001	< <b>.0001</b>
sadness	0.27	16.20	< .0001	< <b>.0001</b>	

*Table S8: Alternative test of the difference between posed and spontaneous versions of each emotion using unbiased hit rates.* We tested whether posed expressions were better recognised than their spontaneous counterparts using paired sample one-sided t-tests (adjusted for multiple comparisons using a Bonferroni-Holm correction). In these analyses, the outcome measure is unbiased hit rate (Wagner, 1993). A positive estimate indicates higher recognition for posed stimuli compared to their spontaneous counterparts. In both the Dutch and Chinese perceiver sample, posed versions of all emotional expressions were recognised significantly more accurately than spontaneously elicited expressions.

Perceiver culture	Stimulus Culture	Emotion	Type	Estimate	Statistic	P value	Adjusted P Value	
NL	NL	posed	anger	0.69	8.73	< .0001	< <b>.0001</b>	
		spontaneous	anger	0.47	3.38	= 0.001	= <b>0.02</b>	
		posed	compassion	0.42	3.48	< .001	= <b>0.02</b>	
		spontaneous	compassion	0.47	5.17	< .0001	< <b>.001</b>	
		posed	disgust	0.68	8.25	< .0001	< <b>.0001</b>	
		spontaneous	disgust	0.59	4.73	< .001	= <b>0.004</b>	
		posed	fear	0.50	3.71	< .001	= <b>0.01</b>	
		spontaneous	fear	0.37	0.22	= 0.42	= 1	
		posed	joy	0.97	28.60	< .0001	< <b>.0001</b>	
		spontaneous	joy	0.75	11.93	< .0001	< <b>.0001</b>	
		posed	love	0.42	4.12	< .001	= <b>0.004</b>	
		spontaneous	love	0.38	0.65	= 0.26	= 1	
		posed	pride	0.44	4.02	< .001	= <b>0.004</b>	
		spontaneous	pride	0.47	5.59	< .0001	< <b>.001</b>	
		posed	sadness	0.68	6.73	< .0001	< <b>.0001</b>	
		spontaneous	sadness	0.46	3.39	= 0.001	= <b>0.03</b>	
	CN	CN	posed	anger	0.56	4.37	< .0001	= <b>0.002</b>
			spontaneous	anger	0.34	-0.86	= 0.79	= 1
			posed	compassion	0.43	4.09	< .001	= <b>0.004</b>
			spontaneous	compassion	0.41	3.92	< .001	= <b>0.006</b>
			posed	disgust	0.66	8.58	< .0001	< <b>.0001</b>
			spontaneous	disgust	0.68	1.93	= 0.1	= 1
			posed	fear	0.71	11.20	< .0001	< <b>.0001</b>
			spontaneous	fear	0.55	11.42	< .0001	< <b>.001</b>
			posed	joy	0.89	19.11	< .0001	< <b>.0001</b>
			spontaneous	joy	0.83	13.66	< .0001	< <b>.0001</b>
			posed	love	0.47	3.10	= 0.003	= 0.05
			spontaneous	love	0.24	-6.04	= 1	= 1
posed	pride	0.58	5.70	< .0001	< <b>.001</b>			
spontaneous	pride	0.47	4.94	< .0001	= <b>0.001</b>			
posed	sadness	0.67	8.02	< .0001	< <b>.0001</b>			
spontaneous	sadness	0.49	5.40	< .0001	< <b>.001</b>			

Table S9: One-sided t-tests comparing within- and cross-cultural recognition accuracy per emotion and type to chance level for the Dutch sample in Study 3. We calculated recognition accuracy as an arcsine transformed proportion for each video in the stimuli set and compared this to arcsine transformed chance level (0.36).

Perceiver culture	Stimulus Culture	Emotion	Type	Estimate	Statistic	P value	Adjusted P Value
CN	NL	posed	anger	0.55	6.45	< .0001	< <b>.0001</b>
		spontaneous	anger	0.50	5.16	< .0001	< <b>.001</b>
		posed	compassion	0.44	3.61	< .001	= <b>0.01</b>
		spontaneous	compassion	0.53	8.81	< .0001	< <b>.0001</b>
		posed	disgust	0.48	3.84	< .001	= <b>0.007</b>
		spontaneous	disgust	0.35	-0.30	= 0.61	= 1
		posed	fear	0.40	1.27	= 0.11	= 1
		spontaneous	fear	0.28	-3.28	= 1	= 1
		posed	joy	1.08	30.13	< .0001	< <b>.0001</b>
		spontaneous	joy	0.87	14.63	< .0001	< <b>.0001</b>
		posed	love	0.30	-3.43	= 1	= 1
		spontaneous	love	0.30	-3.82	= 1	= 1
		posed	pride	0.35	-0.30	= 0.62	= 1
		spontaneous	pride	0.36	-0.13	= 0.55	= 1
	posed	sadness	0.67	8.81	< .0001	< <b>.0001</b>	
	spontaneous	sadness	0.52	4.51	< .0001	= <b>0.003</b>	
	posed	anger	0.54	5.43	< .0001	< <b>.001</b>	
	spontaneous	anger	0.39	1.14	= 0.14	= 1	
	posed	compassion	0.48	6.92	< .0001	< <b>.0001</b>	
	spontaneous	compassion	0.50	8.43	< .0001	< <b>.0001</b>	
	posed	disgust	0.58	6.06	< .0001	< <b>.0001</b>	
	spontaneous	disgust	0.51	0.98	= 0.22	= 1	
	posed	fear	0.62	8.36	< .0001	< <b>.0001</b>	
	spontaneous	fear	0.45	1.97	= 0.04	= 0.76	
	posed	joy	1.04	26.25	< .0001	< <b>.0001</b>	
	spontaneous	joy	1.00	18.31	< .0001	< <b>.0001</b>	
	posed	love	0.42	1.92	= 0.03	= 0.62	
	spontaneous	love	0.25	-6.65	= 1	= 1	
posed	pride	0.46	3.54	< .001	= <b>0.02</b>		
spontaneous	pride	0.35	-0.76	= 0.77	= 1		
posed	sadness	0.69	11.81	< .0001	< <b>.0001</b>		
spontaneous	sadness	0.49	4.54	< .0001	= <b>0.002</b>		

Table S10: One-sided t-tests comparing within- and cross-cultural recognition accuracy per emotion and type to chance level in the Chinese Sample for Study 3. We calculated recognition accuracy as an arcsine transformed proportion for each video in the stimuli set and compared this to arcsine transformed chance level (0.36).

Expresser	Emotion	Term	Percent Recognised	OR	Log Odds	SE	Statistic	p value
NL	disgust	Posed	40.1	0.64	-0.44	0.06	-7.38	< .0001
	disgust	Spontaneous	32.7	0.71	-0.35	0.08	-4.40	< .0001
	fear	Posed	25.0	0.31	-1.16	0.07	-16.85	< .0001
	fear	Spontaneous	13.9	0.47	-0.75	0.10	-7.70	< .0001
	compassion	Posed	17.4	0.18	-1.70	0.08	-20.42	< .0001
	compassion	Spontaneous	21.9	1.36	0.31	0.10	3.23	= 0.001
	love	Posed	17.5	0.16	-1.83	0.09	-19.29	< .0001
	love	Spontaneous	13.9	0.73	-0.31	0.11	-2.89	= 0.004
	pride	Posed	19.0	0.20	-1.60	0.08	-19.71	< .0001
	pride	Spontaneous	21.2	1.16	0.15	0.09	1.59	= 0.11
	anger	Posed	42.1	0.72	-0.33	0.06	-5.92	< .0001
	anger	Spontaneous	21.4	0.36	-1.03	0.08	-12.10	< .0001
	sadness	Posed	40.1	0.65	-0.44	0.06	-7.34	< .0001
	sadness	Spontaneous	20.8	0.37	-1.00	0.09	-11.55	< .0001
	joy	Posed	67.3	2.30	0.83	0.07	12.15	< .0001
	joy	Spontaneous	47.3	0.38	-0.96	0.08	-11.62	< .0001
CN	disgust	Posed	38.9	0.62	-0.48	0.06	-8.28	< .0001
	disgust	Spontaneous	40.8	1.09	0.08	0.08	1.09	= 0.28
	fear	Posed	43.1	0.74	-0.31	0.06	-5.18	< .0001
	fear	Spontaneous	27.4	0.47	-0.76	0.08	-9.26	< .0001
	compassion	Posed	17.6	0.19	-1.67	0.08	-20.18	< .0001
	compassion	Spontaneous	16.8	0.94	-0.06	0.10	-0.62	= 0.54
	love	Posed	22.5	0.26	-1.35	0.08	-16.99	< .0001
	love	Spontaneous	6.1	0.21	-1.57	0.13	-12.16	< .0001
	pride	Posed	31.5	0.44	-0.81	0.06	-13.39	< .0001
	pride	Spontaneous	21.9	0.60	-0.51	0.08	-6.05	< .0001
	anger	Posed	30.9	0.44	-0.83	0.06	-13.60	< .0001
	anger	Spontaneous	11.7	0.29	-1.25	0.10	-12.42	< .0001
	sadness	Posed	40.0	0.64	-0.44	0.06	-7.36	< .0001
	sadness	Spontaneous	22.4	0.41	-0.90	0.09	-10.58	< .0001
joy	Posed	60.2	1.64	0.50	0.07	7.26	< .0001	
joy	Spontaneous	54.0	0.74	-0.30	0.08	-3.77	< .001	

Table S11: Comparison of posed and spontaneous expressions of each emotion, in the Dutch sample in Study 3. To test the difference between posed and spontaneous expressions, we carried out logistic regressions for each emotion separately, with recognition accuracy for each trial as a binary outcome variable (correct vs. incorrect), expression type (posed vs. spontaneous) as a fixed effect, and perceiver ID as a random effect. The intercept was set to posed expressions.

Expresser	Emotion	Term	Percent Recognised	OR	Log Odds	SE	Statistic	p value	
NL	disgust	Posed	22.9	0.23	-1.48	0.09	-16.62	< .0001	
	disgust	Spontaneous	14.0	0.50	-0.70	0.11	-6.63	< .0001	
	fear	Posed	16.1	0.16	-1.86	0.10	-19.07	< .0001	
	fear	Spontaneous	9.2	0.50	-0.69	0.12	-5.76	< .0001	
	compassion	Posed	19.2	0.19	-1.64	0.09	-19.28	< .0001	
	compassion	Spontaneous	26.2	1.57	0.45	0.09	4.80	< .0001	
	love	Posed	9.6	0.07	-2.65	0.14	-19.51	< .0001	
	love	Spontaneous	9.2	0.96	-0.04	0.13	-0.32	= 0.75	
	pride	Posed	14.2	0.13	-2.04	0.10	-20.06	< .0001	
	pride	Spontaneous	13.1	0.90	-0.10	0.11	-0.93	= 0.35	
	anger	Posed	28.2	0.35	-1.05	0.07	-14.88	< .0001	
	anger	Spontaneous	23.5	0.76	-0.27	0.09	-3.04	= 0.002	
	sadness	Posed	39.1	0.59	-0.53	0.07	-7.60	< .0001	
	sadness	Spontaneous	26.0	0.49	-0.71	0.09	-8.13	< .0001	
	joy	Posed	77.0	4.36	1.47	0.09	17.24	< .0001	
	joy	Spontaneous	56.9	0.32	-1.13	0.09	-12.19	< .0001	
	CN	disgust	Posed	31.6	0.39	-0.93	0.07	-12.50	< .0001
		disgust	Spontaneous	26.2	0.74	-0.31	0.09	-3.47	< .001
fear		Posed	34.4	0.48	-0.73	0.07	-10.94	< .0001	
fear		Spontaneous	20.0	0.44	-0.82	0.09	-9.00	< .0001	
compassion		Posed	21.7	0.23	-1.46	0.08	-18.07	< .0001	
compassion		Spontaneous	23.2	1.10	0.09	0.09	1.02	= 0.31	
love		Posed	17.2	0.15	-1.92	0.11	-17.56	< .0001	
love		Spontaneous	6.7	0.30	-1.21	0.14	-8.93	< .0001	
pride		Posed	21.2	0.22	-1.52	0.09	-17.59	< .0001	
pride		Spontaneous	12.2	0.48	-0.73	0.11	-6.76	< .0001	
anger		Posed	28.4	0.37	-1.01	0.07	-14.69	< .0001	
anger		Spontaneous	14.4	0.40	-0.91	0.10	-9.28	< .0001	
sadness		Posed	40.8	0.65	-0.43	0.07	-6.53	< .0001	
sadness		Spontaneous	23.1	0.39	-0.95	0.09	-10.66	< .0001	
joy		Posed	73.5	3.68	1.30	0.09	15.13	< .0001	
joy		Spontaneous	70.2	0.81	-0.21	0.09	-2.31	= 0.02	

Table S12: Comparison of posed and spontaneous expressions of each emotion, in the Chinese sample in Study 3. To test the difference between posed and spontaneous expressions, we carried out logistic regressions for each emotion separately, with recognition accuracy for each trial as a binary outcome variable (correct vs. incorrect), expression type (posed vs. spontaneous) as a fixed effect, and perceiver ID as a random effect. The intercept was set to posed expressions.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.42</u></b>	0.09	0.20	0.06	0.04	0.02	0.03	0.12
compassion	0.12	<u>0.17</u>	0.17	0.10	0.09	0.06	0.06	<b>0.23</b>
disgust	0.12	0.10	<b><u>0.40</u></b>	0.09	0.11	0.04	0.05	0.10
fear	0.13	0.12	0.18	<b><u>0.25</u></b>	0.10	0.04	0.07	0.10
joy	0.02	0.02	0.02	0.02	<b><u>0.67</u></b>	0.08	0.12	0.03
love	0.03	0.06	0.05	0.04	<b>0.44</b>	<u>0.18</u>	0.16	0.04
pride	0.04	0.07	0.05	0.05	<b>0.47</b>	0.10	<u>0.19</u>	0.04
sadness	0.11	0.12	0.12	0.11	0.06	0.03	0.04	<b><u>0.40</u></b>

*Table S13: Study 3.* Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge Dutch posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.21</u></b>	0.20	0.18	0.10	0.07	0.04	0.10	0.10
compassion	0.10	<b><u>0.22</u></b>	0.17	0.12	0.12	0.05	0.11	0.12
disgust	0.11	0.13	<b><u>0.33</u></b>	0.07	0.14	0.06	0.10	0.06
fear	0.16	<b>0.17</b>	<b>0.17</b>	<u>0.14</u>	0.10	0.05	0.09	0.11
joy	0.03	0.06	0.05	0.05	<b><u>0.47</u></b>	0.13	0.17	0.03
love	0.04	0.08	0.05	0.05	<b>0.42</b>	<u>0.14</u>	0.18	0.04
pride	0.04	0.10	0.08	0.05	<b>0.38</b>	0.10	<u>0.21</u>	0.04
sadness	0.13	0.19	0.16	0.14	0.07	0.04	0.07	<b><u>0.21</u></b>

*Table S14: Study 3.* Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge Dutch spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.31</u></b>	0.10	0.14	0.16	0.07	0.02	0.06	0.14
compassion	0.12	<u>0.18</u>	0.12	0.19	0.07	0.04	0.06	<b>0.22</b>
disgust	0.14	0.08	<b><u>0.39</u></b>	0.12	0.07	0.03	0.03	0.13
fear	0.08	0.09	0.15	<b><u>0.43</u></b>	0.08	0.03	0.06	0.08
joy	0.02	0.03	0.03	0.04	<b><u>0.60</u></b>	0.09	0.16	0.02
love	0.04	0.08	0.04	0.08	<b>0.35</b>	<u>0.22</u>	0.15	0.04
pride	0.05	0.08	0.06	0.08	<b>0.31</b>	0.06	<b><u>0.31</u></b>	0.05
sadness	0.12	0.10	0.11	0.16	0.05	0.02	0.04	<b><u>0.40</u></b>

*Table S15: Study 3.* Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge Chinese posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<u>0.12</u>	0.15	0.11	<b>0.16</b>	0.13	0.05	0.15	0.13
compassion	0.10	<u>0.17</u>	0.14	<b>0.21</b>	0.10	0.04	0.10	0.14
disgust	0.15	0.10	<b>0.41</b>	0.11	0.06	0.02	0.05	0.09
fear	0.08	0.17	0.13	<b>0.27</b>	0.10	0.03	0.09	0.12
joy	0.03	0.05	0.04	0.06	<b>0.54</b>	0.06	0.18	0.04
love	0.05	0.13	0.09	0.11	<b>0.32</b>	<u>0.06</u>	0.17	0.07
pride	0.04	0.09	0.06	0.08	<b>0.41</b>	0.05	<u>0.22</u>	0.04
sadness	0.11	0.14	0.13	0.20	0.08	0.03	0.07	<b>0.22</b>

Table S16: Study 3. Confusion matrix demonstrating the proportion of guesses per emotion when Dutch participants judge Chinese spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b>0.28</b>	0.11	0.09	0.14	0.14	0.03	0.05	0.17
compassion	0.12	<u>0.22</u>	0.05	0.15	0.12	0.05	0.05	<b>0.24</b>
disgust	0.12	0.10	<b>0.32</b>	0.11	0.14	0.03	0.04	0.14
fear	0.09	0.13	0.09	<b>0.34</b>	0.15	0.04	0.07	0.09
joy	0.03	0.04	0.02	0.03	<b>0.74</b>	0.05	0.07	0.03
love	0.02	0.08	0.02	0.08	<b>0.51</b>	<u>0.17</u>	0.07	0.04
pride	0.05	0.09	0.03	0.06	<b>0.47</b>	0.05	<u>0.21</u>	0.04
sadness	0.10	0.13	0.06	0.16	0.08	0.03	0.03	<b>0.41</b>

Table S17: Study 3. Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge Chinese posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<u>0.14</u>	<b>0.20</b>	0.05	0.11	<b>0.20</b>	0.06	0.11	0.13
compassion	0.11	<b>0.23</b>	0.05	0.17	0.17	0.06	0.09	0.13
disgust	0.16	0.16	<b>0.26</b>	0.12	0.10	0.02	0.05	0.13
fear	0.08	<b>0.23</b>	0.04	<u>0.20</u>	0.19	0.06	0.08	0.13
joy	0.03	0.05	0.02	0.04	<b>0.70</b>	0.05	0.07	0.03
love	0.05	0.16	0.03	0.08	<b>0.44</b>	<u>0.07</u>	0.11	0.05
pride	0.04	0.11	0.02	0.06	<b>0.54</b>	0.06	<u>0.12</u>	0.06
sadness	0.09	0.22	0.05	0.16	0.14	0.05	0.06	<b>0.23</b>

Table S18: Study 3. Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge Chinese spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.28</u></b>	0.11	0.16	0.08	0.08	0.03	0.05	0.21
compassion	0.11	<u>0.19</u>	0.07	0.09	0.15	0.04	0.06	<b>0.29</b>
disgust	0.14	0.11	<b><u>0.23</u></b>	0.11	0.17	0.03	0.04	0.18
fear	0.14	0.16	0.07	<u>0.16</u>	<b>0.17</b>	0.05	0.07	<b>0.17</b>
joy	0.02	0.03	0.02	0.02	<b><u>0.77</u></b>	0.05	0.07	0.03
love	0.03	0.08	0.03	0.04	<b>0.58</b>	<u>0.10</u>	0.09	0.05
pride	0.04	0.09	0.03	0.03	<b>0.55</b>	0.06	<u>0.14</u>	0.05
sadness	0.11	0.16	0.07	0.07	0.10	0.04	0.05	<b><u>0.39</u></b>

*Table S19: Study 3.* Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge Dutch posed stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Emotions	Responses							
	anger	compassion	disgust	fear	joy	love	pride	sadness
anger	<b><u>0.24</u></b>	0.21	0.07	0.08	0.12	0.05	0.07	0.16
compassion	0.11	<b><u>0.26</u></b>	0.05	0.09	0.15	0.08	0.10	0.17
disgust	0.13	0.18	<u>0.14</u>	0.07	<b>0.25</b>	0.05	0.07	0.10
fear	0.15	<b>0.23</b>	<u>0.06</u>	<u>0.09</u>	0.15	0.06	0.10	0.17
joy	0.04	0.10	0.03	0.03	<b><u>0.57</u></b>	0.06	0.13	0.05
love	0.03	0.10	0.03	0.03	<b>0.55</b>	<u>0.09</u>	0.11	0.05
pride	0.05	0.13	0.03	0.04	<b>0.48</b>	0.09	<u>0.13</u>	0.05
sadness	0.12	0.22	0.05	0.10	0.12	0.06	0.07	<b><u>0.26</u></b>

*Table S20: Study 3.* Confusion matrix demonstrating the proportion of guesses per emotion when Chinese participants judge Dutch spontaneous stimuli. Underlined numbers indicate the correct response for each emotion, bolded numbers indicated the most frequently selected response.

Term	Sum of Squares	Mean Square	Numerator Df	Denominator Df	F Value	p Value
type	54.23	54.23	1.00	46469.00	500.85	< <b>.0001</b>
emotion	220.76	31.54	7.00	46469.00	291.29	< <b>.0001</b>
congruency	3.11	3.11	1.00	46469.00	28.73	< <b>.0001</b>
type:emotion	13.44	1.92	7.00	46469.00	17.73	< <b>.0001</b>
type:congruency	0.44	0.44	1.00	46469.00	4.10	= <b>0.04</b>
emotion:congruency	3.85	0.55	7.00	46469.00	5.08	< <b>.0001</b>
type:emotion:congruency	2.38	0.34	7.00	46469.00	3.13	= <b>0.003</b>

*Table S21: Alternative test of the effect of expression type (posed vs. spontaneous) and emotion using unbiased hit rates, in Study 3.* An unbiased hit rate (Wagner, 1993) is the joint probability both that a stimulus is correctly identified (given that it is presented) and that a response is correctly used (given that it is used). Each participant has one unbiased hit rate calculated per emotion category, stimulus culture, and expression type: these numbers capture how accurately participants identified stimuli of a given emotion, taking that participants' guessing patterns into account. For these analyses, we regressed unbiased hit rates onto expression type, cultural congruency, and emotion.

Perceiver culture	Stimulus Culture	Emotion	Estimated Difference	Statistic	P value	Adjusted P Value
NL	NL	anger	0.23	11.29	< .0001	< <b>.0001</b>
		compassion	-0.02	-1.06	= 0.85	= 1
		disgust	0.07	3.42	< .001	= <b>0.004</b>
		fear	0.15	8.47	< .0001	< <b>.0001</b>
		joy	0.15	9.42	< .0001	< <b>.0001</b>
		love	0.05	2.85	= 0.002	= <b>0.02</b>
		pride	0.01	0.81	= 0.21	= 0.98
		sadness	0.19	9.88	< .0001	< <b>.0001</b>
	CN	anger	0.22	12.67	< .0001	< <b>.0001</b>
		compassion	0.04	2.46	= 0.007	= 0.06
		disgust	-0.02	-1.04	= 0.85	= 1
		fear	0.17	9.19	< .0001	< <b>.0001</b>
		joy	0.09	5.09	< .0001	< <b>.0001</b>
		love	0.22	12.77	< .0001	< <b>.0001</b>
		pride	0.14	7.82	< .0001	< <b>.0001</b>
		sadness	0.18	9.65	< .0001	< <b>.0001</b>
CN	NL	anger	0.06	3.23	< .001	= <b>0.008</b>
		compassion	-0.02	-1.65	= 0.95	= 1
		disgust	0.08	4.52	< .0001	< <b>.0001</b>
		fear	0.08	5.35	< .0001	< <b>.0001</b>
		joy	0.14	9.70	< .0001	< <b>.0001</b>
		love	0.01	0.86	= 0.2	= 0.98
		pride	0.04	2.66	= 0.004	= <b>0.04</b>
		sadness	0.09	5.35	< .0001	< <b>.0001</b>
	CN	anger	0.17	9.95	< .0001	< <b>.0001</b>
		compassion	0.03	2.07	= 0.02	= 0.14
		disgust	0.03	1.30	= 0.1	= 0.58
		fear	0.15	8.67	< .0001	< <b>.0001</b>
		joy	0.04	2.79	= 0.003	= <b>0.03</b>
		love	0.15	8.95	< .0001	< <b>.0001</b>
		pride	0.14	8.01	< .0001	< <b>.0001</b>
		sadness	0.17	8.83	< .0001	< <b>.0001</b>

Table S22: Comparison of posed and spontaneous versions of each emotion using unbiased hit rate.

We tested whether posed expressions were better recognised than their spontaneous counterparts using paired sample one-sided t-tests (adjusted for multiple comparisons using a Bonferroni-Holm correction). In these analyses, the outcome measure is unbiased hit rate (Wagner, 1993). A positive estimate indicates higher recognition for posed stimuli compared to their spontaneous counterparts.

### Emotion Labels in Dutch and Chinese

<i>English</i>	<i>Dutch</i>	<i>Chinese</i>
Anger	Boosheid	气愤
Disgust	Walging	恶心
Fear	Angst	害怕
Sadness	Verdriet	悲伤
Compassion	Medelijden	同情
Love	Liefde	爱
Joy	Plezier	喜悦
Pride	Trots	骄傲

*Table 23:* Emotion labels used in all three studies, and their Chinese and Dutch translations.

## References

- Wagner, H. L. (1993). On measuring performance in category judgment studies of nonverbal behavior. *Journal of Nonverbal Behavior*, 17, 3–28. [https://idp.springer.com/authorize/casa?redirect\\_uri=https://link.springer.com/article/10.1007/BF00987006&casa\\_token=OdNX9nUz2vcAAAAA:Zebc4jCutkubyqqeKt8eDEvIguGyw1nmPyIbXq20o7mywCIIYVKLrHmYb-BLWb3-1m0D8ADe5t7TQjxHRQ](https://idp.springer.com/authorize/casa?redirect_uri=https://link.springer.com/article/10.1007/BF00987006&casa_token=OdNX9nUz2vcAAAAA:Zebc4jCutkubyqqeKt8eDEvIguGyw1nmPyIbXq20o7mywCIIYVKLrHmYb-BLWb3-1m0D8ADe5t7TQjxHRQ)