Cultural Determinants of Pain Expression: Investigating Cross-Cultural Display Rules

Marie-Pier Plouffe-Demers[1,2], Danielle Samson[1], Diego Leblanc[1], Daphnée Sénécal[1], Gabrielle Kealey[1], Alex Cousineau[1], Daniel Fiset[1] & Caroline Blais[1]

1 Département de psychoéducation et psychologie, Université du Québec en Outaouais
2 Département de psychologie, Université du Québec à Montréal

Context

Effective communication of pain is crucial for human survival, and facial expressions are an important aspect of such communication.

The field of visual perception suggests that recognition of objects depends on the overlap between the observer's mental representation and the stimulus[1]. Applied to facial expression of pain, success of such decoding partly relies on the observer's prior knowledge and experiences, as a facial pattern not corresponding to its expectations could disrupt communication.

Cultural norms could potentially affect the display of pain expression, with collectivist cultures promoting stoicism and individualistic cultures allowing for a wider range of pain intensities[2].

The present study aims to capture the expectations of participants from diverse cultural backgrounds regarding pain expression intensity.

Figure 1. Previous lab results[3], East Asians (second row) tend to expect pain expressions of greater intensity than Westerners (first row).

Method choice and validation

Pilot Study 1 - Reverse correlation

In a pilot study (N=11), we attempted to use the reverse correlation method[4], as used in Saumure's study, to capture the expected pain facial expression at varying levels of intensity. However, the results were inconclusive.

Figure 2. Base face (top) and mental representations of pain expression of low intensity (left) and high intensity (right)

Pilot Study 2 - Adaptation method

Design: In lab
Participants: 22 Westerners (9 men)
Task :
- 120 scenarios ,
- Two emotional intensities (low and high),
- Three emotions: Pain (40), Anger (40) and Joy (40)

Results

- The results indicate that the method is effective in capturing intensity variations, as the intensity levels depicted in the scenarios are a strong predictor of the expected facial expression intensity [F(2,2489.96)=147.85, p<.001].

- The method also proved to be sensitive to potential cultural norms (i.e. variations in the facial configuration and intensity expected for the expression of different emotions).
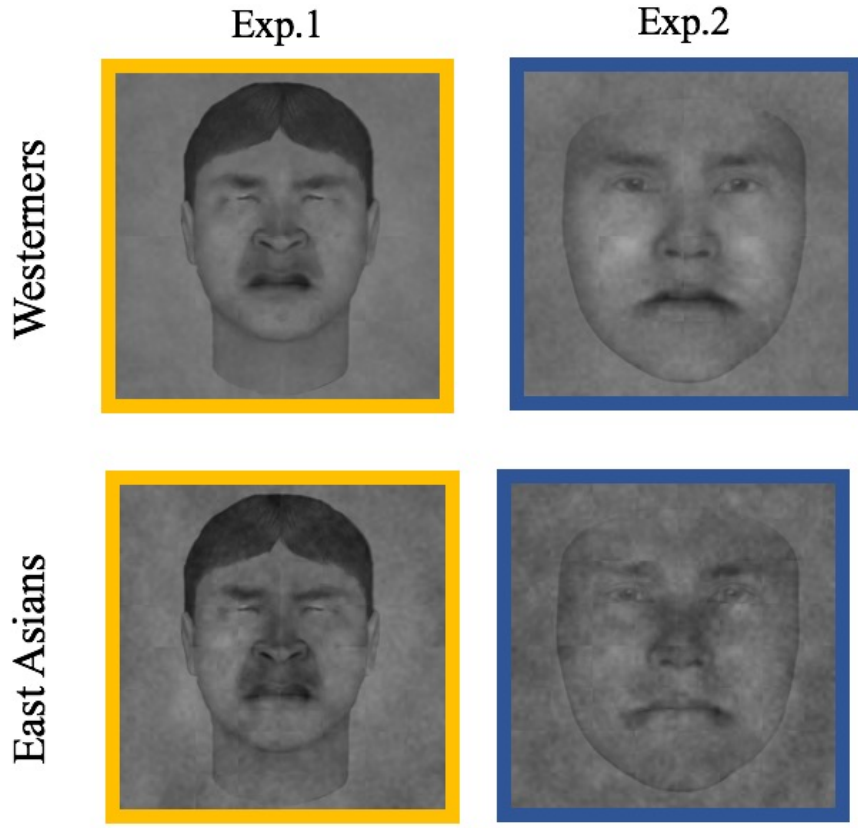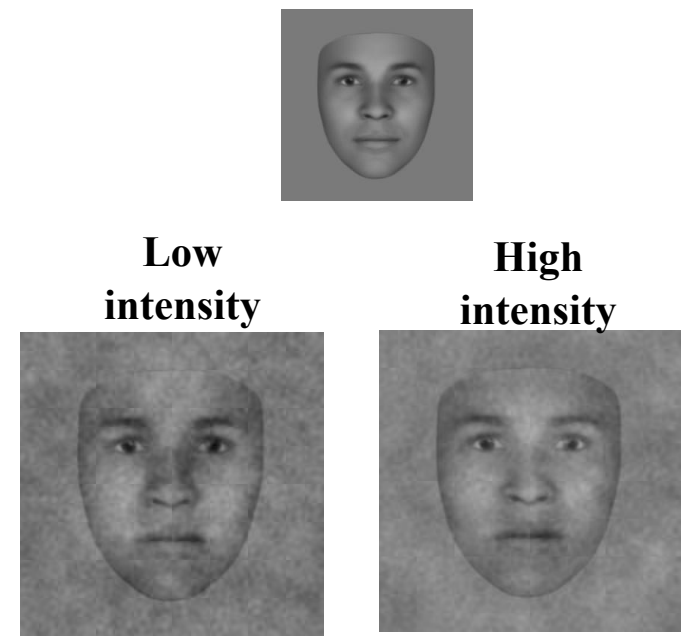

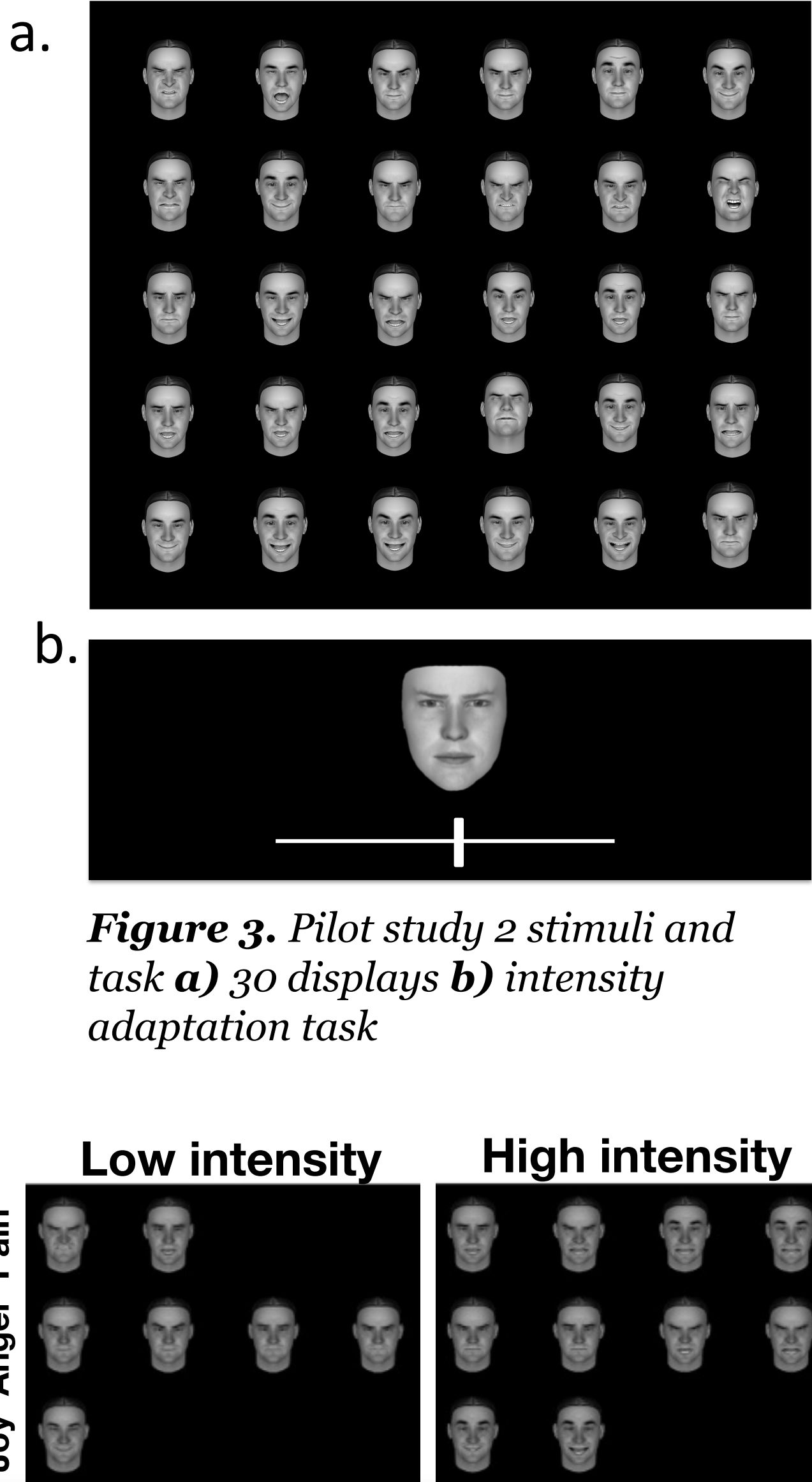*Figure 3. Pilot study 2 stimuli and task a) 30 displays b) intensity adaptation task*

Figure 4. Selected facial patterns for the scenarios of low intensity (left) and high intensity (right).

Method

Design: Online (Lab Maestro Pack & Go[5])

Participants: 640 (320 men)
8 cultural groups (N= 80 per group)
- Western Europe,
- Eastern Europe,
- Anglophone Countries,
- Latin America,
- South-Asia,
- East-Asia,
- Sub-Saharan Africa,
- Middle East/North Africa.

This segmentation follows the cultural orientation groups proposed by Schwartz[6].

Scenarios: Participants will be presented with various scenarios (N= 40) presenting individuals experiencing different pain levels (i.e. Low or High).

Table 1
Examples of the scenarios

Intensity	Scenarios
Low	
	(…) hit their head on something.
	(…) got a cramp while exercising.
High	
	(…) just got their wisdom tooth removed.
	(…) got food poisoning.

Stimuli: On each trial, face identity will be randomly sampled between 14 profiles (2 gender profiles x 7 ethnic profiles).
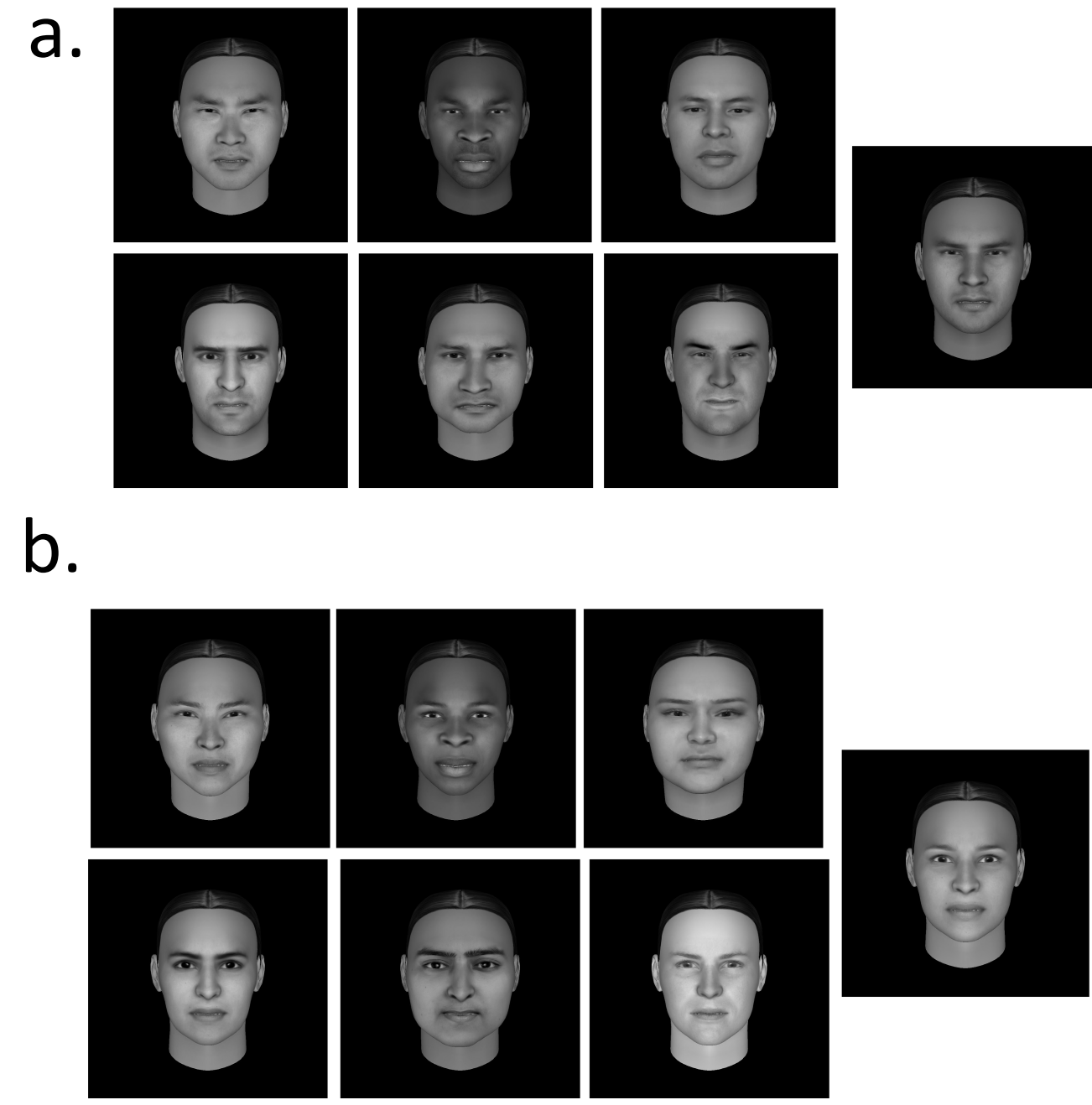

Figure 5. Example of stimuli. a) males b) females Ethnic profiles: East Asian, Black African, Latin, Middle-Eastern, South Asian, White, Mix-Ethnicity

Procedures

a. Presentation of the scenario
b. Evaluation of the emotional state (valence, intensity, free labeling)
c. Expected expressivity (display, intensity adjustment)

Questionnaires

- Cultural affiliation
- Social orientation (individualism /collectivism)[7]
- Pain Catastrophizing Scale[8]
- Appropriate Pain Behavior Questionnaire (expressivity endorsement for pain)[9]

Figure 6. Example of a trial
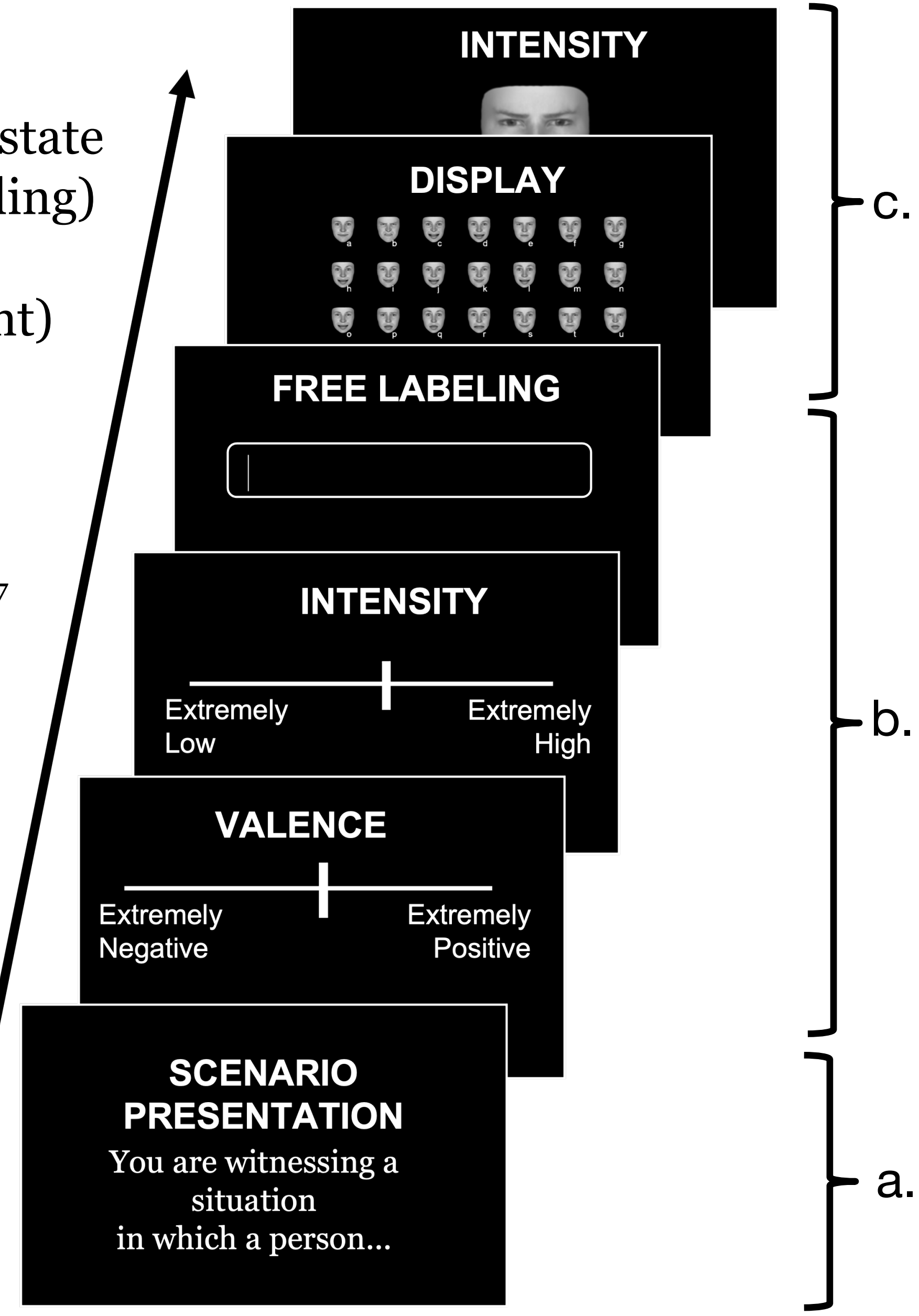
Analysis plan

By using a cluster approach, we aim to identify natural patterns of display rules. Degree of discrepancy between assessment of the emotional state and the intensity of the chosen facial display could also serve as a perceptual measure of expressivity norms. This way we we'll be able to examine whether these match the cultural and contextual differences proposed in the existing literature, which is mainly composed of studies that used self-reported questionnaires.
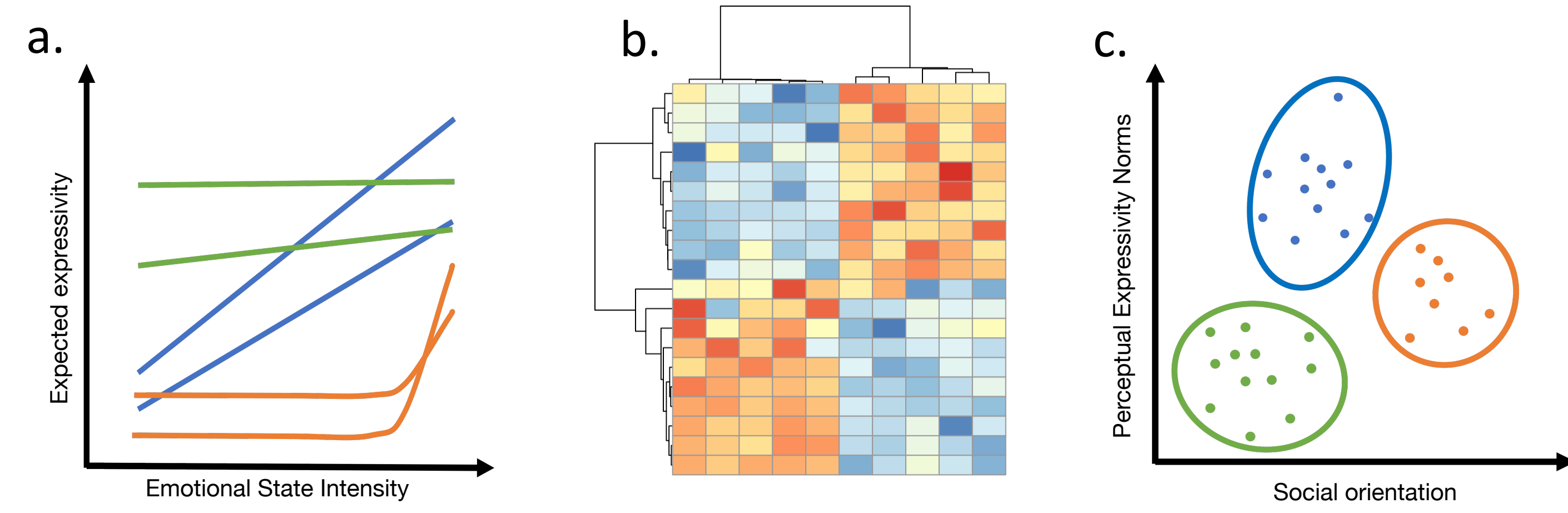

Figure 1. Visual representations of some of the expected outcomes from our study. a) Patterns of pain display rules. b) Hierarchical clustering dendrogram based on the correlation matrix of display rules. c) Dispersion of participants across expressivity norms and social orientation (individualism – collectivism) dimensions. The ellipsoids illustrate natural cultural clusters that could emerge from a k-Mean clustering analysis.

References
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