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Supplementary Materials for

Dissecting abstract, modality-specific and experience-dependent coding of affect in the human brain

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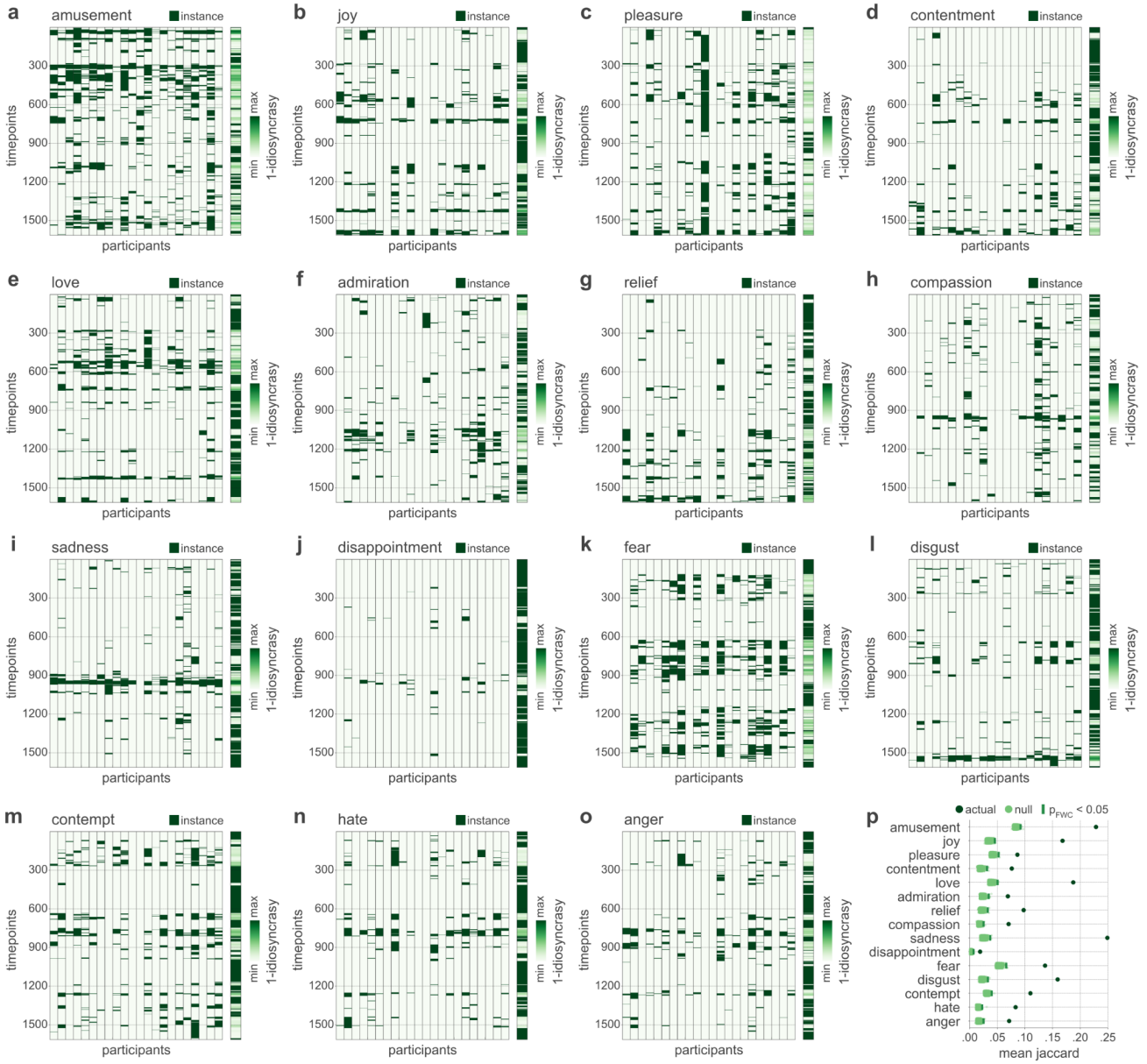
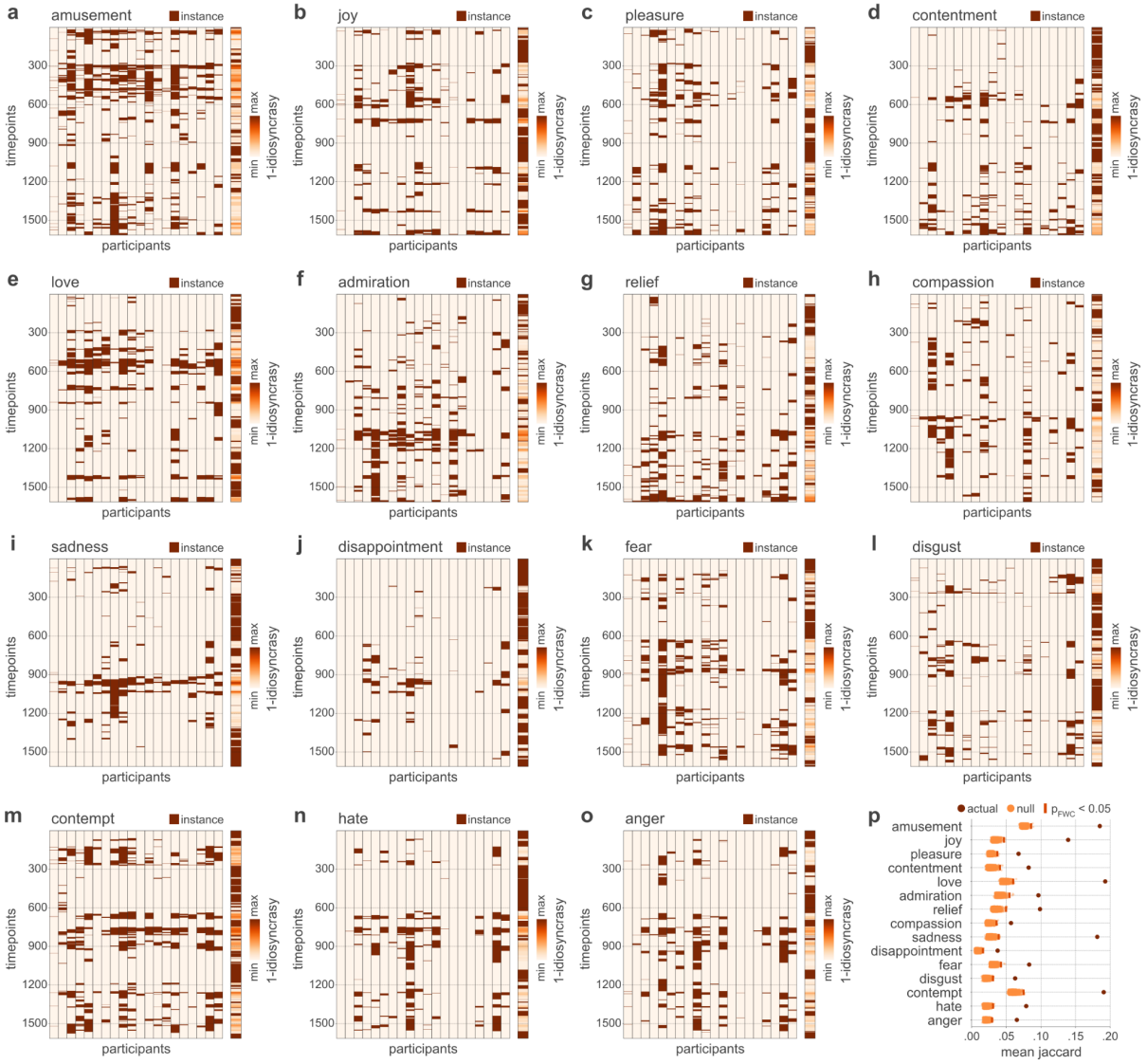
This PDF file includes:

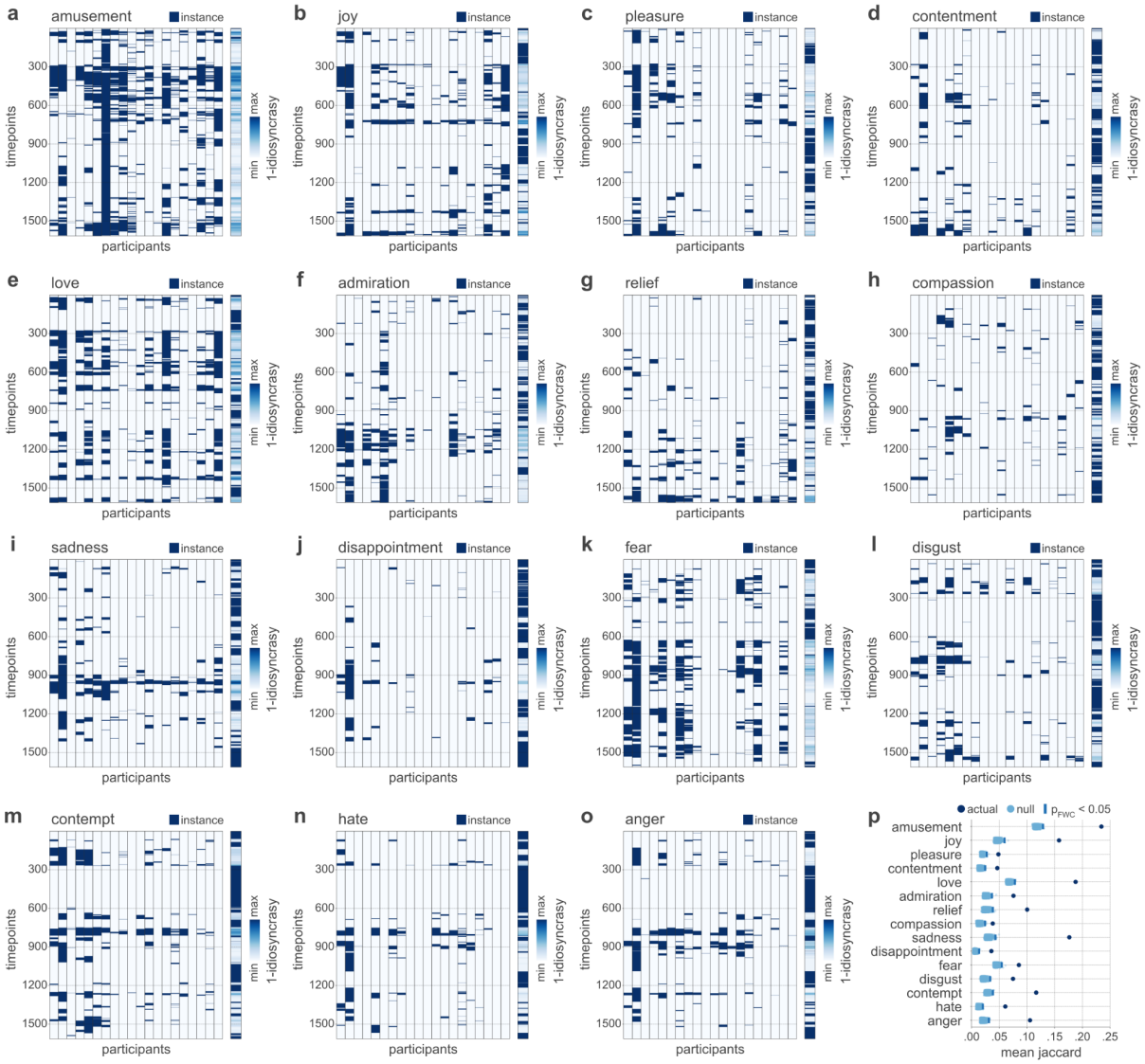
Supplementary Materials



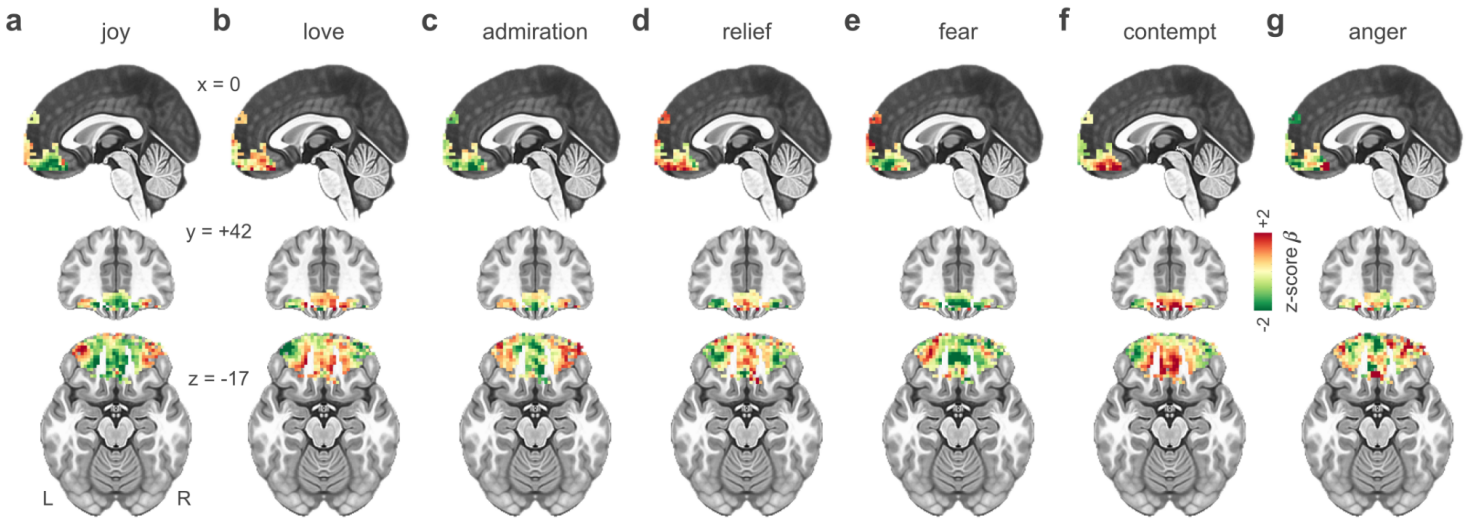
Supplementary Figure 1 - Single-participant real-time annotations of the emotional experience during the multisensory presentation of 101 Dalmatians. Panels a-o depict the presence (dark green) or absence (white) of an emotion (n = 15), for each timepoint (n = 1,614) and participant (n = 22). For each emotion, we also report the timeseries of a 1-idiosyncrasy index for visualization purposes. This index reaches its maximum (dark green) whenever all participants either report the presence or the absence of a specific emotion at the same time. Instead, it reaches its minimum (white) when an emotion is reported by a single individual but not by all other participants (i.e., the maximum idiosyncrasy in the experience of an emotion). As compared to the Jaccard index, the 1-idiosyncrasy coefficient takes into account the between-participant concordance in reporting both the presence and the absence of emotion. In panel p we show the difference between the actual (dark green) and the null (light green) Jaccard indices for each emotion. Green vertical bars represent the Bonferroni-corrected level of significance for the comparison between the actual and the null Jaccard coefficients.



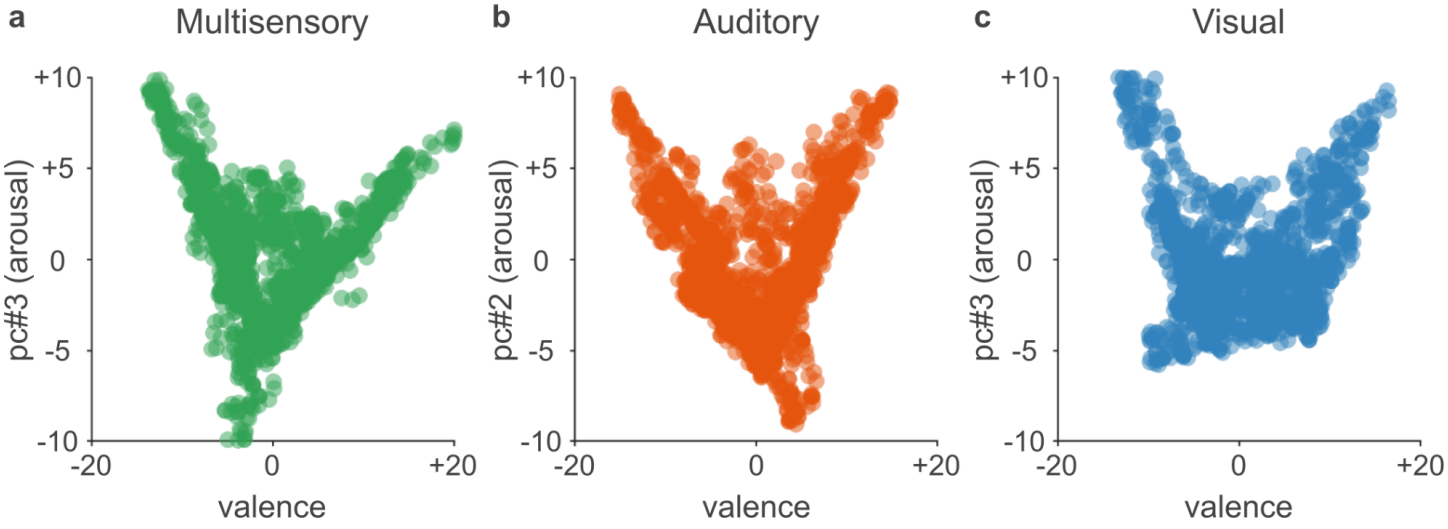
Supplementary Figure 2 - Single-participant real-time annotations of the emotional experience during the auditory-only presentation of 101 Dalmatians. Panels a-o depict the presence (dark orange) or absence (white) of an emotion (n = 15), for each timepoint (n = 1,614) and participant (n = 20). For each emotion, we also report the timeseries of a 1-idiosyncrasy index for visualization purposes. This index reaches its maximum (dark orange) whenever all participants either report the presence or the absence of a specific emotion at the same time. Instead, it reaches its minimum (white) when an emotion is reported by a single individual but not by all other participants (i.e., the maximum idiosyncrasy in the experience of an emotion). As compared to the Jaccard index, the 1-idiosyncrasy coefficient takes into account the between-participant concordance in reporting both the presence and the absence of emotion. In panel p we show the difference between the actual (dark orange) and the null (light orange) Jaccard indices for each emotion. Orange vertical bars represent the Bonferroni-corrected level of significance for the comparison between the actual and the null Jaccard coefficients.



Supplementary Figure 3 - Single-participant real-time annotations of the emotional experience during the visual-only presentation of 101 Dalmatians. Panels a-o depict the presence (dark blue) or absence (white) of an emotion (n = 15), for each timepoint (n = 1,614) and participant (n = 20). For each emotion, we also report the timeseries of a 1-idiosyncrasy index for visualization purposes. This index reaches its maximum (dark blue) whenever all participants either report the presence or the absence of a specific emotion at the same time. Instead, it reaches its minimum (white) when an emotion is reported by a single individual but not by all other participants (i.e., the maximum idiosyncrasy in the experience of an emotion). As compared to the Jaccard index, the 1-idiosyncrasy coefficient takes into account the between-participant concordance in reporting both the presence and the absence of emotion. In panel p we show the difference between the actual (dark blue) and the null (light blue) Jaccard indices for each emotion. Blue vertical bars represent the Bonferroni-corrected level of significance for the comparison between the actual and the null Jaccard coefficients.



Supplementary Figure 4 - Average normalized maps of regression coefficients for significantly cross-decoded emotions. To prove that the coding of emotional states in the medial prefrontal cortex is categorical, we classify the patterns of activity within this region based on the fitting coefficients of each emotion across groups and conditions. We find that classification reaches the statistical significance for 7 emotions: joy (panel a), love (panel b), admiration (panel c), relief (panel d), fear (panel e), contempt (panel f), and anger (panel g). Here, we report the maps of standardized regression coefficients averaged across participants (n = 50) for all significantly cross-decoded emotions. R = right hemisphere, L = left hemisphere. Coordinates are in MNI space (LPI convention).



Supplementary Figure 5 - Relationship between valence and arousal in real-time reports of the affective experience. This figure shows the relationship between valence and the arousal component obtained from principal component analysis of annotations of emotion categories. In all three experimental conditions (multisensory, panel a; auditory, panel b; visual, panel c), we observe the typical V-shape association reported in a wealth of previous studies. In the figures, each colored dot represents a timepoint in the stimulus (n = 1,614).