reconsidering the Duchenne smile

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introduction

1. the Duchenne marker is commonly associated with “genuine” smiles
2. prev. lit. doubts validity of marker as indication of “true” joy
3. prev. work shows D smiles better predicted by smile intensity

methods

1. BP4D+ database: 140 participants subject to various tasks to elicit 4 emotions, measured AU activity (presence & intensity)
2. used Bayseian multi-level modeling and zero-inflated beta regression on 2 mediation pathways, predicting the effect of:
   - amusement on AU6 (1)
   - amusement & smile intensity on AU6 (2)

results

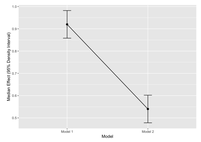

Figure 1: Mediation Effect of AU6 intensity per Model

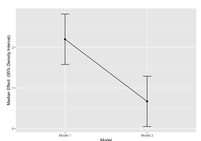

Figure 2: Mediation effect of AU6 presence per Model

smiles with the **Duchenne marker** are thought to be more **genuine**

we found that **smile intensity** was a far **better predictor** of positive emotion than the Duchenne marker

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more figures

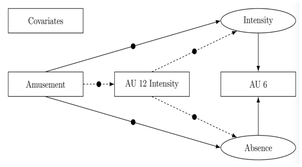

Figure 3: AU 6 is decomposed into intensity (beta) and absence (zero-inflation) components, both predicted by amusement. The solid line represents the mediation pathway present in all models while the dashed lines represent the pathways in only Model 2.

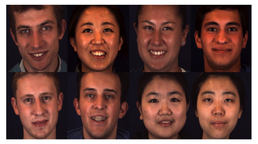

Figure 4: The top v. bottom row show Duchenne v. ND smiles. The columns show smiles during each of the four tasks.

discussion

1. the Duchenne marker is at best *probabilistic* in determining “real” amusement
2. AU12 mediated 80% of amusement’s effect on AU6 intensity and 94% of its effect on AU6 presence
3. the mediation model shows that when controlling for au12, the residual predictive power of amusement predicting au6 intensity is minimal
4. predicting emotion is rarely deterministic– we must seek multimodal channels for more accurate inference

next steps

1. task classifier
2. automatic emotion perception
3. mTurk Study for feature extraction