What Faces Reveal
Impaired Affect Display in Facial Paralysis

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INTRODUCTION

Our face speaks volumes about us before we ever say a word. Faces convey a wealth of information such as identity and gender. They also play a key role in affect display, the external display of one’s emotions.

Patients with facial paralysis have impaired facial movement and facial asymmetry at rest. The muscles of facial expression are critically important for affect display and communication. This restriction of facial expression can have a dramatic impact on interpersonal relations.

The objective of the present study was to evaluate affect display in patients with facial paralysis as compared to normal individuals.

We hypothesized that patients with facial paralysis would have impaired affect display as compared to normal individuals when they were attempting to perform the same facial expressions.

Our sub-hypothesis was that the observers would assign negative emotional states and personal attributes to faces with facial paralysis. These hypotheses were explored with a latent class analysis.

METHODS AND MATERIALS

Institutional Review Board approval was received for this study. A group of forty randomly selected subjects (17 females and 23 males) participated in the study, from March 2010 to July 2010. Ages ranged from 18 to 61.

We created a survey to study affect display in normal and paralyzed subjects. Twelve of the patients had no lesions or paralysis and were considered normal controls. Twelve of the patients had upper and lower division facial paralysis. Seven of the facial paralysis patients had left-sided paralysis while five had right-sided paralysis.

A smile and repose photograph was used for each patient. Survey questions were associated with each photograph. One questionnaire contained a smile photograph of a patient while the other contained a repose photograph, but none of the questionnaires contained both a smile and a repose photograph of the same patient.

The survey questions were designed to measure how observers perceive affect display in faces with and without facial paralysis. For each picture, subjects were given 11 choices and were asked to pick the ones that best described the person in the photograph.

Five of the choices were of primary emotions (happy, disgust, anger, sadness, and fear) for which facial expressions are universally characteristic of the human species, as described by Ekman et al. The remaining six choices represented the personal attributes trustworthy, friendly, neutral, hostile, energetic and tired.

RESULTS

Two covariates, smile and paralysis were included in the model. Based on the two parsimony measures, AIC and BIC, the three latent class model was the most parsimonious, so we chose it for our analysis. The conditional probabilities are displayed graphically in Figure 1.

The first latent class is dominated by negative emotions and attributes, so we term this the negative class. The second class was dominated by happy emotion and energetic, friendly, and trustworthy attributes, so we denoted this the positive class. The final class was dominated by the neutral attribute and was therefore named the neutral class.

These findings show that paralysis significantly affects affect display. Paralyzed faces are most likely to be viewed as displaying negative emotions and attributes. Paralyzed faces in repose have a roughly 1% chance of being viewed positively, compared to a 10% chance for a normal face in repose (figure 2-3).

CONCLUSIONS

Normal faces were classified as positive or neutral the majority of the time, depending on smiling or repose status, while faces with facial paralysis were classified as negative the majority of the time, whether smiling or in repose.

These data provide evidence that faces with paralysis have impaired affect display as compared to normals.

REFERENCES


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