The effects of Botox® injections on facial emotion recognition

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Introduction

It has been proposed that mimicry of emotional facial expressions (EFE) improves their identification. According to Hess and Blairy (2001), it is especially the case when EFE are not prototypical and express emotions of weak intensity. In this perspective, blocking mimicry would be detrimental to a fulfilling comprehension between people.

Neal and Chartrand (2011) observed that emotional perception was impaired by Botox® injections (which paralyze muscles thus dampening the possibility of mimicry). However, stimuli used in their study were black and white pictures of static eyes expressions. **The purpose of the present study is to observe the effects of Botox® injections in a more ecological approach, by using dynamic stimuli of spontaneous facial expressions.**

Recruitment conditions were set in an ecological way as well, as participants were regulars to cosmetic injections and were injected according to their usual preferences.

We also considered whether the motivation to understand others played a role in this process of mimicry, as suggested by Hess and Fischer (2013 ; 2016).

Screenshot of stimuli used

Results

Chi-square tests show **a detrimental effect of Botox® injections on EFE recognition for neutral and disgusted EFE,** since there are no significant differences between correct and incorrect emotional attributions. No effect of Botox® injections is observed for all other EFE : as it is the case for control participants, more Botox patients accurately recognize the EFE than patients that are mistaken.

There is **no clear evidence of emotional contagion**. Although participants reported experiencing happiness in reaction to joyful expressions, this feeling was highly reported throughout the whole experiment, including for expressions of disgust, fear, surprise and neutral expressions.

No effect of motivation is observed on recognition accuracy in the Control group. Due to a too small number of participants, motivation could not be tested in the Botox® group.

Discussion .

The **detrimental effects of Botox®** are evidenced even though a relatively low amount of substance was injected in order to preserve the natural dynamics of the patient's face. We can assume that these effects would increase as the amount of injections increases. This research must be continued with a higher number of participants with injections, since the present sample remains relatively low.

The effects of Botox® injections are discernible when the observers' paralyzed muscles are the same than those of the rated EFE (corrugator). However, they disappear when the emotion is expressed clearly, in a non-ambiguous way. **It seems that mimicry provides a benefit to emotional recognition when expressions are subtle and with little intensity**, as postulated by Hess and Blairy (2001).

We studied the effects of Botox® injections on recognition in an ecological way, regarding stimuli used and the conditions of those injections. **Yet, it would be interesting to observe this phenomenon within real social interactions**, since the absence of emotional contagion may be due to a lesser impact of a video in comparison to a face to face communication. Other facial emotions also need to be investigated.

Method

42 female participants (10 with Botox® injections, 32 without injections, from 30 to 70 years old) recruited from a cosmetic surgery clinic.
Botox® was injected into the corrugator supercilii, the depressor supercilii, the orbiculari oculi and the frontalis muscles.
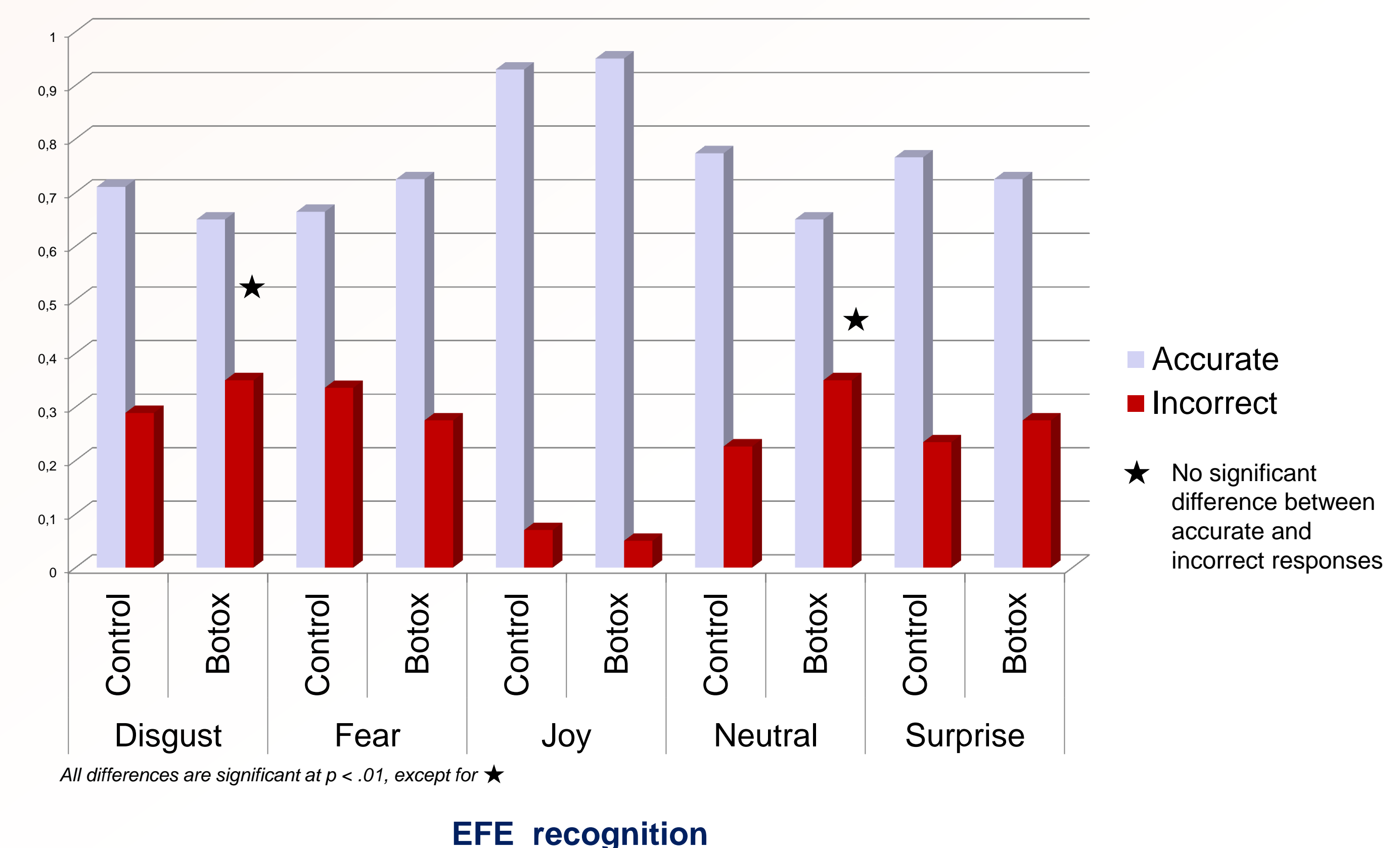**Stimuli**: 20 short **video clips f**rom the DynEmo database (Tcherkassof, Dupré, Meillon, Mandran, Dubois & Adam, 2013). They displayed female persons expressing either **Disgust, Joy, Surprise, Fear, or Neutral** expressions (four females per emotion).

Participants were asked to rate the degree in which each of the stimuli expressed each of these emotions. They were either motivated to understand the stimulus persons' reaction, or asked to pay attention to fashion accessories in order to distract them from the emotional content.
A measure of emotional experience was also taken, to make sure that a potential emotional contagion did not interfere with decoding.

We expected that participants with Botox® injections would have a significantly impaired recognition accuracy compared to the control group.
We expected that motivated participants would have a significantly improved recognition accuracy compared to the non-motivated participants.

All differences are significant at p < .01, except for ★

Accurate
Incorrect
★ No significant difference between accurate and incorrect responses

EFE recognition

References

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