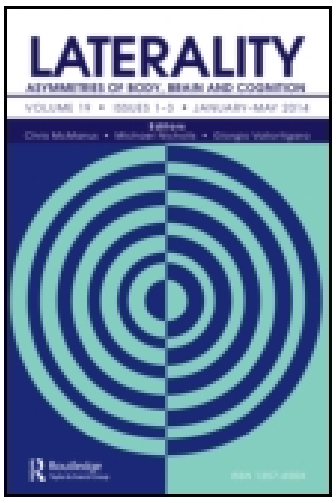

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Facing up to stereotypes: Surgeons and physicians are no different in their emotional expressiveness

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Facing up to stereotypes: Surgeons and physicians are no different in their emotional expressiveness

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Of all the differences between surgeons and physicians that are discussed in the medical profession and in the community at large, one distinction stands out for its frequency of use: surgeons are less emotional than physicians, particularly in their relationships with patients. Here we tested this stereotype by analysing the portraits that 5914 surgeons and physicians had provided for patients to view when selecting a doctor. There is an asymmetry in the degree to which emotional information is conveyed by the face, with the right side being less expressive than the left. Hence, if the stereotype were true, surgeons would be more likely than physicians to show their right cheek in the photographs. While the results for doctors confirmed previous reports of a difference due to sex in which female doctors were more likely to show the left cheek than male doctors, we found that the doctors' specialization did not predict the way they turned in their portraits. Hence, the notion that surgeons face their patients less emotionally than physicians is not supported by the data.

Keywords: Face; Photograph; Medical doctors; Emotion.

There is an asymmetry in the display of emotion on the face in which the left side of the face is more expressive than the right (Dimberg & Petterson, 2000). This difference in expressivity between the two sides of the face is thought to arise due to a bias in the processing of emotion by the two hemispheres of the

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brain. The muscles of the face that are involved in the expression of emotion are innervated predominantly by contralateral connections to the respective hemispheres of the brainstem and motor cortex (Brodal, 1965). Successive experimental studies (Killgore & Yurgelun-Todd, 2007; Ley & Bryden, 1979) and examinations of patients with lesions to one hemisphere (Bowers, Bauer, Coslett, & Heilman, 1985; Bowers, Blonder, Feinberg, & Heilman, 1991) have demonstrated that the right hemisphere of the brain is more involved in the perception and projection of emotion than the left.

One behavioural consequence of this asymmetry in neurobiology is a reliable bias in the way people are portrayed, and seek to portray themselves, in portraits. In a seminal study, McManus and Humphrey (1973) analysed 1474 portraits from the sixteenth to the twentieth centuries and found a significant bias in the cheek shown by the sitter, with 60% showing the left cheek. That is, portraits tend to show the sitter's emotional side (for a recent review see Lindell, 2013).

Interestingly, this overall trend is reliably modulated by individual differences in the degree to which the sitters seek to show their emotionality. People who report having higher levels of emotional expressivity are more likely to pose with their left cheek facing the camera (Nicholls, Clode, Lindell, & Wood, 2002). And, portraits of scientists are less likely to show the left cheek than portraits taken from the general population (Nicholls, Clode, Wood, & Wood, 1999; ten Cate, 2002) and portraits of English and Psychology academics (Churches et al., 2012).

Hence, this bias in face posing is a useful metric for assessing the relative degree to which groups of people seek to express their emotions. In the case of doctors, there is a common conception that surgeons are less emotionally engaged than physicians (Weinberg & Bernstein, 2002). Hence, the examination of face posing in portraits is a viable means of testing this stereotype.

METHODS

Procedure

Portraits of doctors were sourced from the "Find a doctor" link on the websites of two large health companies operating in the USA (http://www.sharp.com/san-diego-doctors/search.cfm and http://www.sutterhealth.org/findadoctor/index.html). We ran a search for doctors on both websites without entering any search terms. The entry for each doctor returned was read and all doctors who provided a photograph had their photograph downloaded and their sex and specializations recorded. This yielded a sample of 5914 doctors.

Both health companies allowed their doctors to enter multiple specializations. While some doctors stated their specializations in keeping with the wording of their specific training or professional association membership, some doctors used

colloquial terms to describe their area of work. Hence, to classify doctors as either surgeons or physicians, two independent raters, both of whom are medical doctors, rated the first stated specialization of each doctor ($n = 141$) as being either surgical or physician based. This was done blind to the photographs of the doctors in that specialization. This process resulted in a high degree of interrater reliability (Cronbach's alpha = 0.947). Disagreements were resolved by consensus. The lists of specializations classified as surgical and physician based are shown in the Supplementary material.

The photograph of each doctor was rated by two independent raters as showing either the left side of the nose, the right side of the nose or both sides of the nose. This was done blind to the specialization of the doctors. These ratings also resulted in a high level of interrater reliability (Cronbach's alpha = 0.959). Disagreements were resolved by consensus. Removing doctors who showed both sides of the nose yielded a final sample of 4680 doctors.

Analyses

To investigate the relationship between specialization and face posing, logistic regression was used with the side of the face showing in the photograph (left, right) as the outcome variable and specialization (Surgeon, Physician) as the predictor variable. Sex was used as a covariate.

RESULTS

Overall there was no bias towards left or right posing by doctors in their portraits, $\chi^2(1) = 0.38$, $p = .54$. Sex alone was a significant predictor of the face-posing angle, correctly predicting 32.4% of the cases, $\chi^2(1) = 7.81$, $p = .001$, with females ($n = 1554$) being more likely to show the left cheek than males ($n = 3126$). When this was followed-up with chi-square tests for each sex, females showed a significant bias towards showing the left cheek over the right cheek, $\chi^2(1) = 6.96$, $p = .008$, but males showed no bias either way, $\chi^2(1) = 1.23$, $p = .27$.

Specialization, however, was not a significant predictor of face-posing angle as a single predictor [surgeons: $n = 1288$, physicians: $n = 3392$, $\chi^2(1) = 0.54$, $p = .46$] or with sex controlled for, $\chi^2(1) = 0.98$, $p = .32$.

As this traditional null hypothesis significance testing approach produced results which did not disprove the null hypothesis, a Bayesian analysis of the data was conducted to determine the probability of either the null or alternative hypothesis being true. The Cox and Snell R^2 of 0.009 with the sample of size of 4680 and the 1 covariate of sex produced a Bayes Factor of 17721006 which is extreme evidence in favour of the null hypothesis (Jeffreys, 1961). These results are shown in Figure 1.

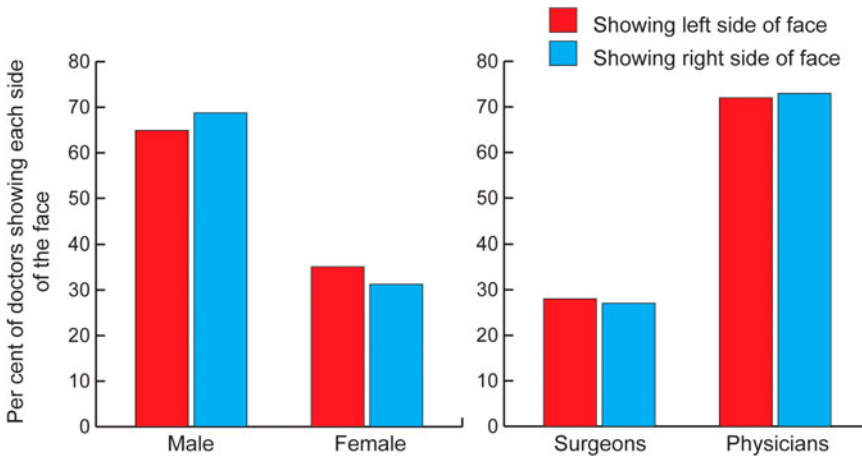

Figure 1. Proportion of left and right facing doctors by sex and specialization.

DISCUSSION

In this study, we analysed the photographs of 5914 surgeons and physicians in order to determine whether, as the stereotype dictates, surgeons present themselves with less emotion and hence are more likely to show the right cheek in their photographs. However, we found no support for this stereotype, since there were no significant differences between the posing positions of surgeons and physicians.

In addition, the doctors showed no overall bias to present one cheek rather than the other. This is inconsistent with the bias shown in samples of portraits taken from art galleries (McManus & Humphrey, 1973) and high school yearbooks (Labar, 1973) which show the left cheek more often and hence are biased to be more emotionally expressive. The lack of bias shown here is however, consistent with the portraits of members of the Royal Society of London (Robinson, 1980). In their analysis of the Royal Society collection, Nicholls et al. (1999) propose that the reduced emotional expressiveness amongst members of the Society may be due to the specific purpose of the portraits. While the portraits previously analysed (Labar, 1973; McManus & Humphrey, 1973) were produced for personal reasons, the collections of the Royal Society, and of doctors' photographs analysed here, were produced for a professional reason. That is, both the doctors in the current study and the members of the Royal Society may have tempered their emotionality in order to appear more professional and so were less likely that the general population to show the left cheek.

Importantly, male and female doctors showed a similar pattern of differences in their posing positions to that shown in other groups of people including scientists (Nicholls et al., 1999; ten Cate, 2002), academics (Churches et al., 2012) and members of the general population (McManus & Humphrey, 1973). Specifically, female doctors were more likely to show the left cheek than male doctors. Hence, it seems that male and female doctors are susceptible to the same stereotype that affects the rest of society: females are more emotionally expressive than males.

A perennial problem in the field of portrait analysis is the fact that at least two people are involved in the production of a photograph: the sitter and the photographer (Churches et al., 2012). Hence, we cannot rule out the possibility that, in keeping with the stereotype, more surgeons would have preferred to sit for their photograph showing as little emotion as possible but that some were guided by a photographer who sought to portray their subject as emotionally engaged. Or, that more physicians would have preferred to sit for their photograph showing their expansive emotionality but that some were convinced by their photographer to appear as analytical as possible.

Perhaps the only medical debate more often heard than those between surgeons and physicians is the debate all specializations can speculate in: Is medical practice an art or a science? (Montgomery, 2006). That there were no differences in posing between surgeons and physicians and no overall bias towards either a more emotional leftward pose or a more rational rightward pose suggest that all specializations face their patients with the equal weight of scientific rationality and human empathy. And hence, both surgeons and physicians unite art and science in practice.

Supplementary material

Supplementary table is available via the "Supplementary" tab on the article's online page (http://dx.doi.org/10.1080/1357650X.2014.888076).

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