



# A cross-sectional study of aggression levels in physicians and orthopaedic surgeons: impact on specialty selection and training?

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## DECLARATIONS

### Competing interests

None

### Funding

None

### Ethical approval

In line with institutional policy, ethical approval was not required.

### Guarantor

TB is guarantor for the paper

### Contributorship

TB collected data, analysed the results, drafted and revised the paper. AW collected data. DB conceived and designed the study, analysed the results and revised the paper. Each of the authors have been active contributors to the paper and have seen, approved and are fully conversant with its contents

## Summary

**Objectives** To determine if current validated psychometric evaluations could determine a difference in basic behavioural characteristics between surgical and medical specialties.

**Design** Cross-sectional study.

**Setting** Two district general hospitals and one University teaching hospital in England, UK.

**Participants** Internal medicine (16) and trauma and orthopaedic (20) consultants.

**Main outcome measures** Aggression levels as assessed by the Buss and Warren questionnaire. The self-administered questionnaire assesses aggression in terms of physical, verbal, anger, hostility, indirect hostility and an overall assessment of aggression.

**Results** All participants had aggression scores below the population average. We found a significant difference ( $P < 0.01$ ) in total level of aggression, with orthopaedic consultants scoring a mean of 61.1 (standard deviation [SD] 9.2) and physicians 51.3 (SD 9.5). When analysis of the five different subtypes of aggression was carried out, orthopaedic surgeons scored significantly higher in terms of verbal aggression ( $P = 0.005$ ), hostility ( $P = 0.002$ ) and indirect hostility ( $P = 0.03$ ).

**Conclusion** This study joins a growing evidence base for aspects of behaviour indicative of a given specialty. Aggression is a relatively stable behavioural characteristic from adolescence, and as such this is the first study of its type to suggest that the differences in behavioural characteristics seen between specialties are inherent, rather than learned. It is unclear if the differences observed represent an attraction of that specialty to the personality type or is required for success within the given specialty. Whether this can be used in terms of selection into higher specialty training, or influence training within specialties, requires further work.

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We would like to thank all participants for their time and good humour

**Reviewer**

William Coppola

**Introduction**

The reduction in training hours for future consultants has directed a number of remedial processes to reduce the impact of a shorter postgraduate experience.<sup>1</sup> One suggestion is an improvement in the selection process prior to acceptance onto a specialist training rotation in an effort to reduce the numbers of trainees who may not be suited to a given career.<sup>2-4</sup> Another, using andragogical education theories, is to structure training to individual trainees, taking into account differences in experience, behaviour and personality.<sup>5</sup> Our aim was to see if the current validated psychometric evaluations could determine a difference in stable behavioural characteristics between surgical and medical specialties,<sup>6</sup> as this may inform methods to aid selection into specialty and training within specialty. To do this, we compared aggression levels between orthopaedic consultants and medical consultants.

**Background**

A number of reports in the literature have studied aspects of personality characteristics within different specialties. Psychometric studies have demonstrated higher levels of conscientiousness, extraversion and emotional stability in surgeons compared with their medical colleagues.<sup>7,8</sup> Further lighter-hearted endeavours have supported the notion that surgeons park their cars quicker and are more attractive and taller than their physician counterparts.<sup>9,10</sup> Orthopaedic surgeons in particular have been shown to be stronger and have larger hands than their non-surgical colleagues.<sup>11,12</sup>

Swedish and Finnish studies have shown that physicians are at lower risk of ischaemic heart disease than their surgical counterparts. When psychosocial work characteristics were analysed, physicians consistently scored lower on perception of a physically demanding job and work tempo, and higher in ability to relax after work. Surgeons generally worked longer hours, and while they found that it had a negative impact on their social lives, they perceived their work as varied and interesting and none regretted their choice in specialty. All these are thought to contribute to higher risk factors for coronary heart disease.<sup>13-15</sup>

Differences in learning styles have also been found, with evidence suggesting that abstract/reflective learners chose medical specialties whereas convergent/problem-solving learners chose surgical specialties.<sup>16</sup> The andragogical approach to training would look to encompass these differences in learning styles within a training programme, and previous studies have demonstrated that learning styles are influenced by personality type,<sup>17</sup> which in turn consists of basic behavioural attributes.

There is, however, a paucity of evidence to examine basic behavioural characteristics, such as aggression traits. Aggression traits are known to remain relatively stable from late childhood onwards, throughout adult life. These traits are therefore likely to be present in trainees and remain unaltered throughout their medical careers.<sup>18-20</sup> This pilot study compared aggression scores in orthopaedic surgeons and their medical colleagues.

**Methods**

We used the validated Buss and Warren questionnaire<sup>21</sup> to evaluate the aggression scores of 20 orthopaedic consultants and 16 medical consultants. Convenience sampling was employed to recruit orthopaedic consultants working with one of the authors (TB). The medical consultants (all general internal medicine) were recruited in a similar way by another one of the authors (AW). Surveys were collected from February 2011.

The Buss and Warren questionnaire assesses aggression under the subtypes of: physical, verbal, anger, hostility, indirect hostility and an overall assessment of aggression. Correction for gender was made. Inconsistent reporting on different aspects was assessed using the Inconsistent Responding (INC) Index Score. Data were collected on Microsoft excel spreadsheet and analysed using the Statistical Package for the Social Sciences. Normality was assumed based on previous data using the questionnaire.<sup>21</sup> The unpaired student's *t*-test was used for statistical analysis. *P* values of <0.05 were deemed to be significant.

**Results**

Aggression scores for all participants were lower than the average scores of the general population

**Table 1**  
**Total aggression scores and subtype aggression scores in orthopaedic and medical consultants**

	<i>Physicians mean, (SD)</i>	<i>Orthopaedics mean, (SD)</i>	<i>P value</i>
Total score	51.3 (9.5)	61.1 (9.19)	0.002
Physical aggression	16.88 (15.46)	19.35 (18.33)	0.334
Verbal aggression	30.13 (21.62)	51.6 (25.11)	0.005
Anger	35.88 (19.56)	44 (18.89)	0.1
Hostility	36.69 (23.89)	59.6 (21)	0.002
Indirect hostility	11 (16.75)	22.4 (18.23)	0.03

SD, standard deviation

for total aggression and subtypes. We found a significantly higher ( $P < 0.01$ ) level of aggression within the orthopaedic group (Table 1). Orthopaedic consultants scored a mean of 61.1 (standard deviation [SD] 9.19) and physicians 51.31 (SD 9.5). When analysis of the five different subtypes of aggression was carried out, orthopaedic surgeons were significantly more aggressive in terms of verbal aggression ( $P = 0.003$ ), hostility ( $P = 0.005$ ) and indirect hostility ( $P = 0.018$ ). There was a trend toward more physical aggression and anger within the orthopaedic group; however, this did not reach statistical significance. All questionnaires showed acceptable INC index scores.

## Discussion

We describe a cross-sectional survey demonstrating higher levels of verbal aggression, hostility and indirect hostility in orthopaedic consultants as compared with their medical colleagues.

There are several potential areas for systematic bias in our study. All participants were aware of the study design and aims. However, anonymity was assured and this should reduce error. Convenience sampling and small numbers may have reduced external validity. Convenience sampling results in selection bias, and in our study all the physicians were recruited for district general hospitals, whereas the orthopaedic surgeons were recruited from both district general and University teaching hospitals. Although most of the general internal medical specialties are

represented within our sample, orthopaedic consultants were the only surgical specialty included, and therefore care must be taken before extrapolating to other specialties.

Previous reports in the literature describe basic behavioural differences between the specialty characteristics of surgeons and physicians.<sup>2,7-15</sup> It is unclear from these reports if the differences are due to inherent or learned behaviours, and this pilot study is the only study to date, linking a basic and stable behavioural characteristic to specialty.

The higher levels of aggression in orthopaedic surgeons could be an adaptation due to surgeons having perceived higher levels of job related stress. However, as aggression is a relatively stable trait, it is likely that the correlation between aggression and specialty reflects the selection process.<sup>18-20</sup> This process could be governed by the attraction of a given specialty to a doctor, the selection process of candidates into a specialty, or the dropout of candidates that are not suited to a specialty. It is unclear from this work which of these factors would be dominant but, in the authors' opinion, all are likely to contribute.

It is noteworthy that all of the participants in this study had aggression scores far below the population average. This would suggest that the medical profession as a whole is not an aggressive one and may be a function of either the personality type that aspires to enter medical school, or the selection process into medical school. As high levels of aggression can be seen as a negative, or even unprofessional trait, it is reassuring to see low levels within all participants, even though there are significant differences within these low levels.

This study joins a growing evidence base for aspects of behaviour indicative of a given specialty.<sup>2,7-15</sup> Aggression is a relatively stable characteristic from adolescence, and as such this is the first study of its type to suggest that the differences in behavioural characteristics seen between specialties are inherent, rather than learned. It is unclear if the differences observed represent an attraction of that specialty to the personality type, or is required for success within the given specialty. Whether this can be used in terms of selection into higher specialty training or influence training within specialties, requires further work.

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