Pursuing a career in trauma and orthopaedics: using behavioural science as a skeleton

As a medical student, what would encourage you to consider a career in T&O and what are the perceived barriers to such a career?

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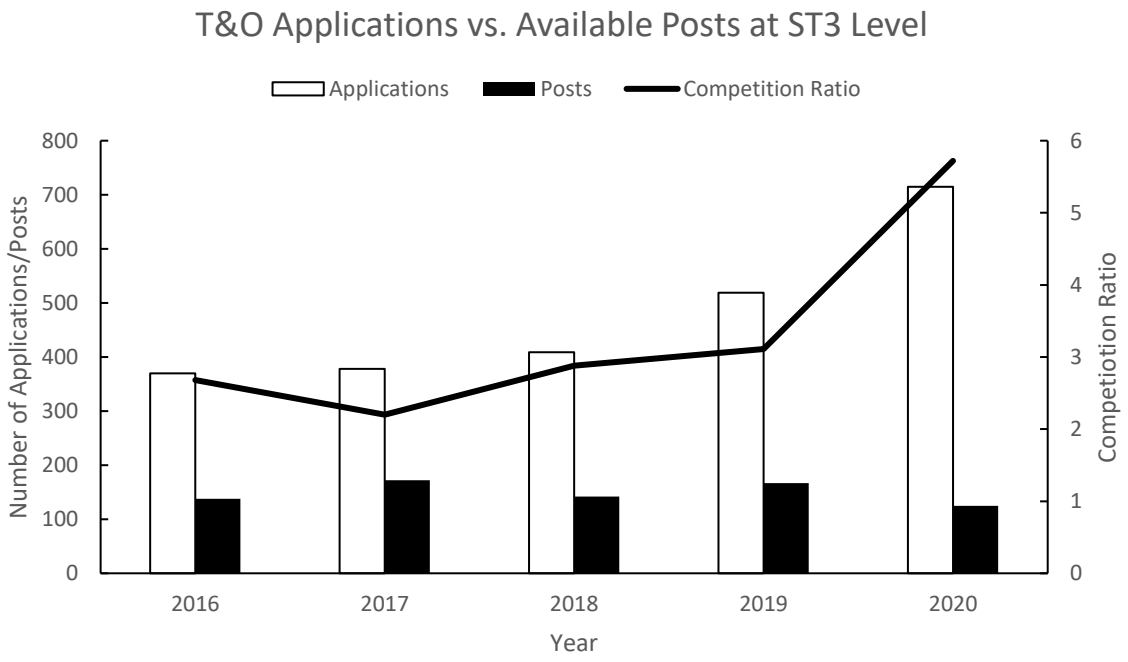
Word Count: 996

Introduction

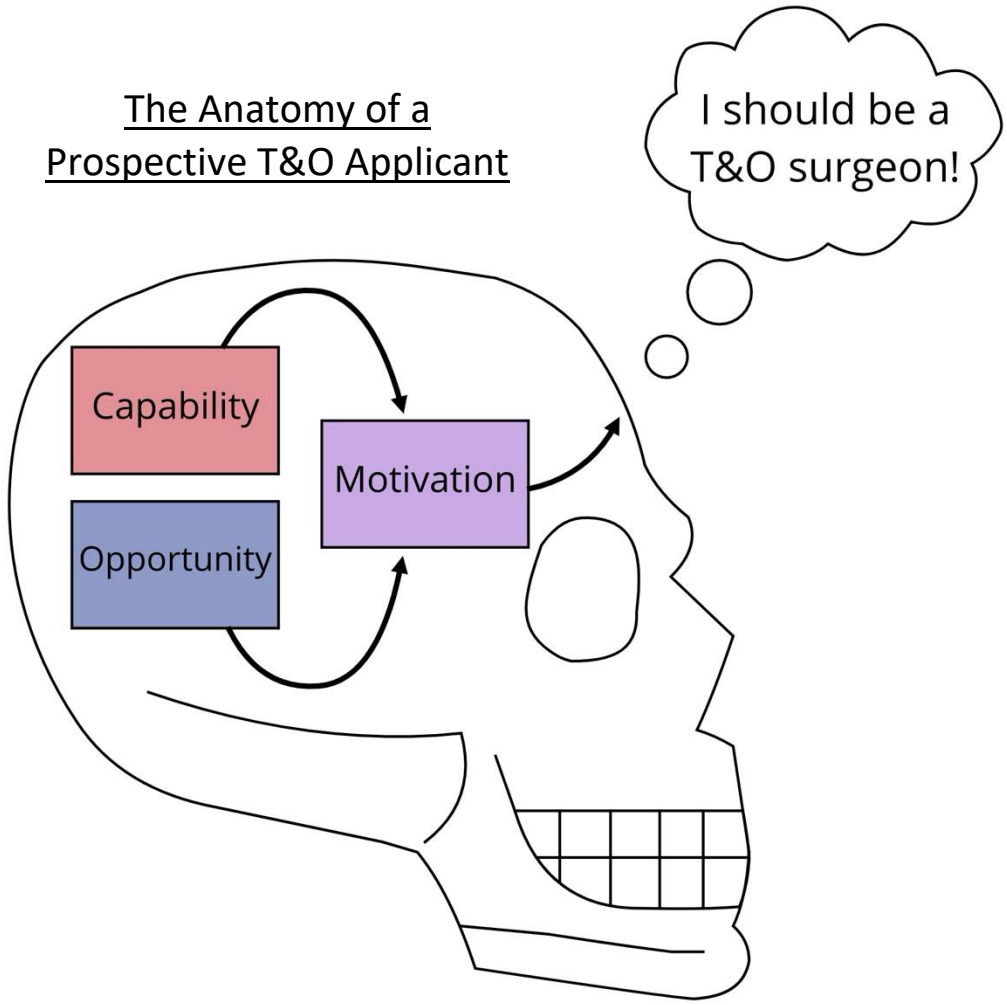
Choosing a specialty to pursue is a decision medical students grapple with throughout medical school. Currently, the General Medical Council recognises 65 specialties and 31 sub-specialties within the fields of medicine and surgery[1], creating a heavy burden of choice. Trauma and Orthopaedics (T&O) is a popular and increasingly competitive specialty choice, with consistently more applications than posts available at specialty training level 3 (ST3) [2] (Figure 1).

Figure 1:



Why some choose T&O, whilst others do not, is in essence a question of human behaviour. It is a highly multifaceted decision; therefore, adopting a systematic approach is the best way to analyse the relevant factors. The COM-B system, a framework developed in the field of behavioural science, is a model based on the relationship between three key components: capability, opportunity and motivation[3] (Figure 2). Adapting this model to analyse the interplay of these components provides a useful skeleton on which to assess the drivers and barriers to a career in T&O.

Figure 2:



Capability

Capability describes an individual's ability to perform the tasks required of T&O surgeons. Manual dexterity is required in all surgical careers, including T&O. A study found that medical students interested in surgical careers perceived their own manual dexterity as higher than those who were not. However, when manual dexterity was measured objectively in both groups, no significant difference was found – suggesting self-perception of dexterity may be a greater driver of surgical career choice than objective manual dexterity[4]. Furthermore, gender differences in visuospatial skills and gaming experience[5,6] can mean that, on average, male medical students

initially acquire surgical skills quicker[6–8]. This may discourage female medical students early on by impacting their self-perception of dexterity. However, providing feedback, one-to-one training and more practice eliminates these differences[8–10], so a barrier for female medical students may simply be the standard surgical teaching environment.

T&O surgeons often endure physical strain, with one study finding 67% of T&O surgeons suffer work-related musculoskeletal disorders[11]. Another study found that 75% of medical students experienced musculoskeletal pain during surgical rotations and 31% reported that if surgery was less physically demanding, they would be more likely to consider it as a career[12]. T&O can be psychologically demanding as well; despite reporting high levels of career satisfaction, T&O surgeons also report a high burnout rate[13–15]. Burnout is a major concern for medical students[16], so the stresses of a career in T&O, both physical and psychological, may be perceived as a significant barrier.

Opportunity

Opportunity, in this context, refers to factors external to a medical student that might influence their decision to pursue T&O. Strong evidence suggests that opportunities for positive surgical experiences are a key driver of interest in surgery, especially active involvement in operative procedures[17]. Student involvement may cause patient safety concerns, but a study following over 6000 spinal surgeries found that medical student involvement did not significantly increase length of stay, infection or readmission[18]. Additionally, interest can be cultivated with improved preclinical education[19] and involvement in surgery interest groups[20].

Diversity issues and negative stereotypes can also pose a significant barrier to interest in T&O[21]. The stereotypical T&O surgeon is a strong but stupid man (efforts have been made to disprove their stupidity[22]) who strives to maintain an intimidating “boys’ club” environment[23–25]. This

perception can make T&O especially unattractive to female medical students[26], which is further exacerbated by the low proportion of female consultants in T&O, at only 7%[27]. Positive role models drive specialty selection[28], so the lack of female role models may contribute to a vicious cycle discouraging even more women from applying[29]. However, negative perceptions of T&O in medical students diminish after T&O rotations[30], suggesting that social connotations and even "badmouthing"[31] of T&O feed perceptions that create a significant barrier to medical student application.

Motivation

Motivation describes all mental processes that would energise and direct a medical student towards T&O. Motivation can be automatic and based on emotional impulses, but when making a complex decision, the key form of motivation is reflective. Reflective motivation involves future plans and evaluations of factors contained within capacity and opportunity. Multiple studies have found lifestyle factors to be the main determining factor for medical students when selecting a specialty[32–34]. "Lifestyle" is a deceptively complex term and encapsulates different ideas about future plans, stress and work-life balance. T&O is perceived as an exciting, high-income specialty that provides instant gratification[35], but also as stressful and requiring long hours[34]. The weighting of these factors tends to vary by gender, with male medical students prioritising income potential whilst female medical students are more likely to be deterred by work-life balance concerns[34,36]. For female medical students, these concerns may relate to family planning which is often subject to unfair bias[37,38]. It is important, however, to recognise that these are generalisations made across large samples and individual priorities may well differ. For all medical students, career planning involves contemplating future priorities, which in turn affects motivation in the present.

Conclusion

Using the COM-B system as a guide, the milieu of factors that affect the decision to choose T&O can be explored and categorised. For the motivation to pursue T&O to arise, drivers within capacity and opportunity must outweigh the barriers. These are summarised in Table 1 below. Overall, the main driver of pursuing T&O is interest seeded by positive role models and opportunities to meaningfully participate in procedures. The barriers converge on the idea of lifestyle, an amalgamation of interacting factors including working life, future plans and stress. Unfortunately, female medical students often perceive more barriers than their male counterparts – these issues must be addressed to allow a more diverse workforce to flourish. More opportunities for experience in T&O with positive role models and improved teaching environments may help correct this imbalance. T&O is a rewarding but challenging specialty, and for capable medical students motivated with the right opportunities, it can become a "bone"-a fide career.

Table 1:

Drivers and Barriers to a Career in T&O	
Drivers	Barriers
Perceived Manual Dexterity	Physical and Psychological Demands
Experience in T&O surgery with positive involvement	Diversity Issues
Preclinical education	Negative Stereotypes
Positive role models	Learning style incompatible with standard teaching style
Action-packed job with gratifying patient outcomes	"Badmouthing"
High job satisfaction	Stress and long hours
Potential for high income	Bias against parenthood/pregnancy

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