Building Holarchies from Hierarchies

A Transactional Analysis Improving safety for Patients, Passengers, Practitioners and Pilots.

John Laszlo, Marianne Lehmann and Guy McLlelland

Introduction:
Surgical training now follows examples established over 20 years ago in aviation by introducing behavioural rating systems into the teaching and training of non-technical skills. However, any system introduced into a safety critical environment must be validated and verifiable. With scrutiny comes complexity, ultimately denying any system's ability to reach its full potential.

We looked at several systems used to assess and train surgeons. These were: CUSP, NOTSS, TCAM, PBA, OSATS and the OSCE. All developed from sound academic principles, all robust and all reproducible. Despite this, these systems are not widely utilised, especially so in general medical and dental practices where surgical procedures are performed and never events occur.

Within these systems, we identified domains most applicable to surgery performed in general medical and dental practice. We then streamlined the domains and conducted a simple safety survey of practitioners and pilots.

Methods:
We collected data on: Incident Reporting, Team Work, Conflict and Clarity, Efficiency and Stability along with: Trust and Learning. We included the conventional Personality Drivers: Be Perfect, Please Me, Try Hard and Be Strong. Graphic symbol's probing the respondent's perception of organisation and teamwork were then added. After some thought we called our survey an OCCAM (Operational Climate /Culture Assessment Measure) after William Occam whose razor wasn't used in surgery but was used to establish diagnostic parsimony, something we aimed for in our study. Ordinal quantitative responses were recorded in 5-Point Likert Items, the results being analysed with non-parametric exploratory testing. Two populations were sampled: General Aviators (GA) and General Practitioners (GP). A group of personnel working in non-safety critical environments provided the control group.

Results:
Responses were GA: 88% n = 44 and GP n = 40% n = 35. With a "Difference in Proportions Test" this is significantly different at the 95% CI level. Significantly more GP's than GA's expressed a higher level of team working (Mann-Whitney U test, $p = 0.0183$), but 80 % of pilots and 89% of practitioners then stated they operate within a team environment. Overall, this result was not significantly different (Z test = 1.075). For all other factors in our OCCAM, there were no significant differences between the GP and GA groups. The Personality Drivers between the groups showed good concordance, with the non-safety critical control repeatedly diverging across several Personality Drivers:

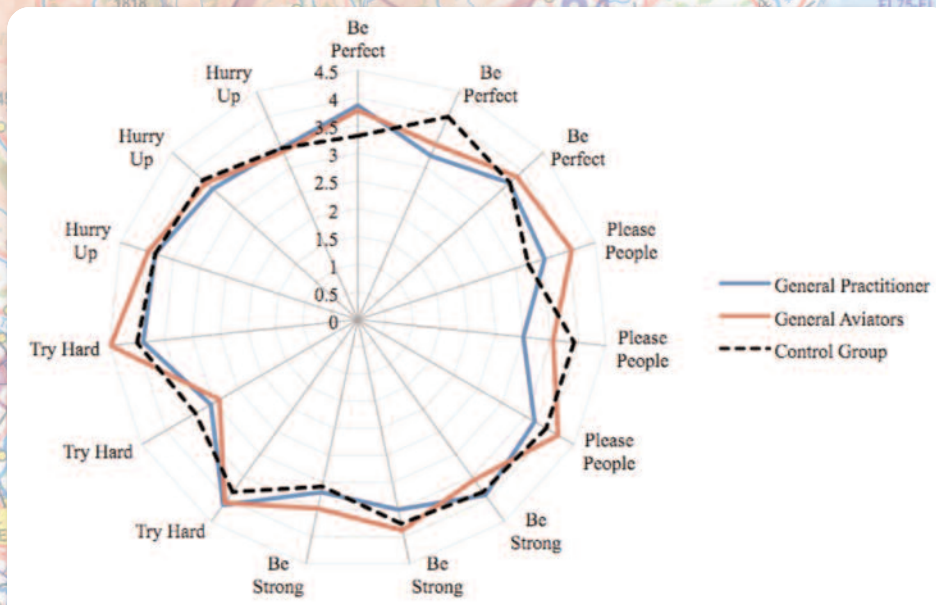

Fig 1. Radar Plot of Comparison of Personality Drivers.

5. GA's and GP's showed significant differences on how they viewed their team with symbols. (Chi 2 31.82 $p < 0.001$) with a further correlation between their perception and most frequent Personality Driver.

Our results were: 20% stated their team to be Circular with the most frequent driver: Please People. 13% stated their team to be Squared with a most frequent Be-Strong driver. Another 13% stated their team to be Pyramidal with a frequent driver of: Hurry Up, while 44% of respondents stated their team is best depicted by a Borromean (interlocking rings), with the most frequent drivers: Be Perfect and Try Hard being expressed equally in this group. Finally, in those reporting no symbol for their team, there was equal expression of the Try Hard and Be Strong personality drivers.

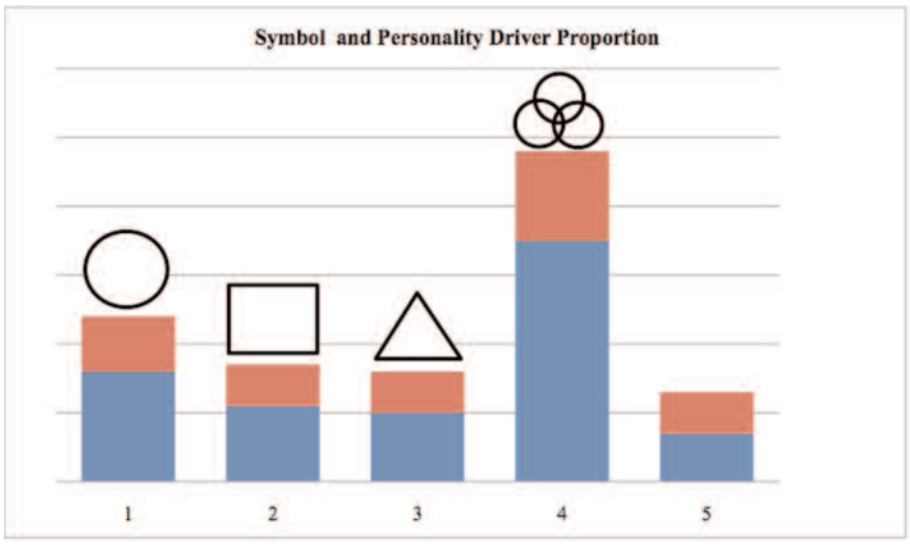

Fig 2: The Blue Proportion is the dominant driver. Red are the remaining driver types.The most frequent drivers with their proportions being: 1. Please People (9/16) 2. Be Strong (6/11) 3. Hurry Up (7/11) 4. Be Perfect /Try Hard (13:13/34) and: 5. Try Hard /Be Strong (3:4/7)

Discussion.
Although there was good development of maturity in non-technical skills and professional behaviours for the respondents, there were some significant differences between the groups too. Following the Francis Report, there will be increased vigilance in all areas of health care. Techniques to train and methods to monitor surgeons now compete with more essential patient safety tasks for diminishing levels of energy and time. One reason repeatedly given in the GP group for an inability to complete our survey was lack of time. (2 to 3 minutes observed) Similarly, in all areas of aviation, time and energy are critical but the 88% GA response rate was not determined by these factors.

Fig 3: One comment from a former RAF fast jet pilot and his team who gave their time to participate is telling:

"Anything we can do to improve patient safety in the NHS we will do...our pleasure!"
Chris Heames QPNI QFI Civilian Hunter Display Pilot North Weald October 2013.

The significant differences might not reflect climate, but more a culture ingrained in certain sectors of the health care community.

The use of Personality Drivers provides a measure of the respondent's view of themselves within their team, recording awareness of operational environment, decision-making processes, communication skills and an ability to interact; either leading or following those, they work with. These categories are already utilized in behavioural rating systems. However, their use is not widely reported in general aviation or general practice where procedures fraught with the same risks facing those in larger similar high reliability hierarchical organisations take place.

Although acceptable and accepted, there are potential cultural and language barriers preventing wider deployment and utilization of behavioural rating systems. By using symbols rather than sentences to investigate an operator's view of their operational environment, we hope to minimise the time needed to complete behavioural rating and training assessments.

We must not forget that behavioural rating systems should be applicable and available not only for the consultants and captains operating in hospital clinics and commercial aviation, but for the practitioners and pilots operating in general practice and general aviation too. Our approach is not so much about breaking barriers in health care hierarchies, but rather building holarchies within them.

Although this study is preliminary and the findings provisional, our initial observations do provide the basis for further research that we intend to pursue with academic support.

Conclusions:
1. Current behavioural rating systems are not widely used in general practices or in general aviation, where human-factor risks still apply.
2. The safety enhancement and risk control lessons learned in one area of aviation or medicine need to reach all areas of medicine and aviation.
3. In deploying effective surgical and flight safety training: Things must be simple or they simply must not be.

We thank the Faculty of Surgical Trainers. RCS Edinburgh, for the opportunity to share these findings with you today.