

“Go Up Under There”: A Semantic Analysis of Direction in Operating Room Instruction

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Background

In our previous work, teaching surgeons used potentially ambiguous language in the OR 12.3 times per minute. Our objectives were to examine ambiguous examples featuring Directional Frame of Reference (DFoR), which involves instructions containing directional terms like “up” or “left”, and to uncover what contributes to understanding or misunderstanding of such instruction.

Summary of Work

We audio- and video-recorded the critical moments of six surgeries, as chosen by the surgeons. With a semanticist, we chose potentially ambiguous DFoR terms commonly flagged in our previous work. We separately interviewed attending and resident surgeons, asking each to describe the meaning of those DFoR terms while they viewed case recordings alongside transcripts. We compared their responses, analyzing them for agreement in direction. We performed thematic analysis on case and interview transcripts for themes related to DFoR.

Summary of Results

Attending and resident surgeons disagreed on direction in 13 of the 26 (50%) DFoR examples. Resulting themes included: 1. Misunderstanding arising from using linear direction to describe three-dimensional space, e.g., “up” for anterior/cephalad/right. 2. Misunderstanding arising from lack of tacit knowledge, e.g., the novice resident not knowing whether “top” in “clean off the top” meant anterior or cephalad. 3. Adding ambiguity by combining degree modifiers with DFoR, e.g., “we're far enough back” combines the ambiguities of “back” (DFoR) and “far enough” (degree modifier). 4. Adding ambiguity inherent in axial parts (noun-like directional terms), e.g. “bottom.” 5. Mitigating ambiguity by physical deixis (viz. pointing) concurrent with speech.

Discussion and Conclusion

Use of ambiguous language with DFoR incurs a high potential for misunderstanding, especially while using linear directions, combining degree modifiers, and adding axial parts. Potential for misunderstanding is exacerbated when individuals have a lack of tacit knowledge. We recommend avoiding linear directions, and instead physically pointing to represent complex 3D directions. We also recommend avoiding axial parts, especially with novice learners. Degree modifiers can be replaced with exact distances e.g., replace “little more anterior” with “1 centimeter anterior.”

Take-home message

Instructions in the teaching operating room containing ambiguous directional framing should be replaced with clear terminology, and should include gestures, especially with novice residents.