CONCEPTUALIZING SPATIAL RELATIONS IN FLIGHT TRAINING

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Audio and Video Recorders

Observer Position

HatCam Views

Instructors wearing the HatCam

We're gonna come out here
and we’re gonna, whenever you’re ready

we’re gonna come out here

and I’m gonna turn you towards the VOR and

We’re gonna do one turn in holding, so

We will either be out here

or here,
Most representations of spatial relations are **multimodal**

- **Verbal Only**: 63%
- **Nonverbal Only**: 32%
- **Verbal and Nonverbal**: 5%

“Hold it there.”

“Don’t rely on just that.”

“Just relax.”

Most representations of spatial relations are **embodied**

- **Using the body, but NOT embodying a spatial relation**: 67%
- **The body as a resource for spatial reasoning**: 33%

“Imagine that centerline running through the middle of your chest.”

Most representations of spatial relations are **situated**

- **Representation not coupled to the local environment**: 21%
- **Representation coupled to the local environment**: 79%

“We’re real close to Bravo.”

“Look inside, then outside; inside, outside.”

**Discussion**

- The notion that SA is primarily a “mental factor” is NOT an empirical finding. – It is an artifact of a particular way of looking for SA.

Enacting Collaborative, Multimodal, Cross-Cultural Representations
Utterance Types in the Wild

- Multimodal utterances
- Collaboratively produced utterances
  - Verbal Continuations
- *Collaborative and multimodal*

#1: FLAPS 5
20° Bank

- Start: Flaps 5.
- FLAPS 5 speed
- N1 45% (approx 1 knot/sec decel)
- Establish 20° bank (PF check VSI, ALT, PLI)
- Stick shaker
  - Smoothly apply MAX Power (PM adjust to GA)
    - Level wings, do not change config, retract SB
    - Power comes up, apply nose down trim
    - Airspeed increases, lower pitch to 5 - 6°
  - Approaching FLAPS 5 speed - 65%
  - Finish: FLAPS 5 speed

I: if we start out flaps five (1) sp...
[looks to computer monitor and right index point to it]
Let's go to flaps five,
[raises right arm and opens right and left palms to make "five"]
FLAPS five speed
[PF positions his hands as if to hold a yoke and pushes forward]
that's what we are gonna go to, okay?
[shakes right and left hands rhythmically]

PM: Yes, I know difference between
Boeing and (Company X)’s procedure.
Our procedure just trim out at flap five speed (0.2)
I: and then
[make two fists to represent holding yoke and pulls toward his chest]
PM: keep back pressure only,
[I continues holding his two fists near his chest]
not applying any more trim.

PM: It’s very really difficult
[models pushing the yoke]
[stopping modeling nose up trim]
to get Ah, (0.5) back to normal (0.2)
[models pushing the yoke]
PF: Ah----- recover from
PM: because () you have to push
[models pushing the yoke again]
I: Once those engines,
   [cupped hands at side below shoulders]
   they are under slung engines,
   [two beats with cupped hands at side below shoulders]
   right?
The engines, these.
   [arms extended out above previous engine gesture location]
PF: (unintelligible)
   [fingertips of both hands rotate up quickly]
I: So, it's gonna .
   [bends forward bringing wing gesture down]
PF: tend to, yeah
   [flicks fingertips up again]
   [entire body and arms come up]
I: hhh.
   It's gonna tend to (0.3)
   [bends at waist and lowers arms]
   sling this airplane up.
   [entire body and arms come up again]