



DGfS Annual Meeting 2024:
Language and Attitude

Co-speech gesture in negative questions: Evidence from American soap opera actors

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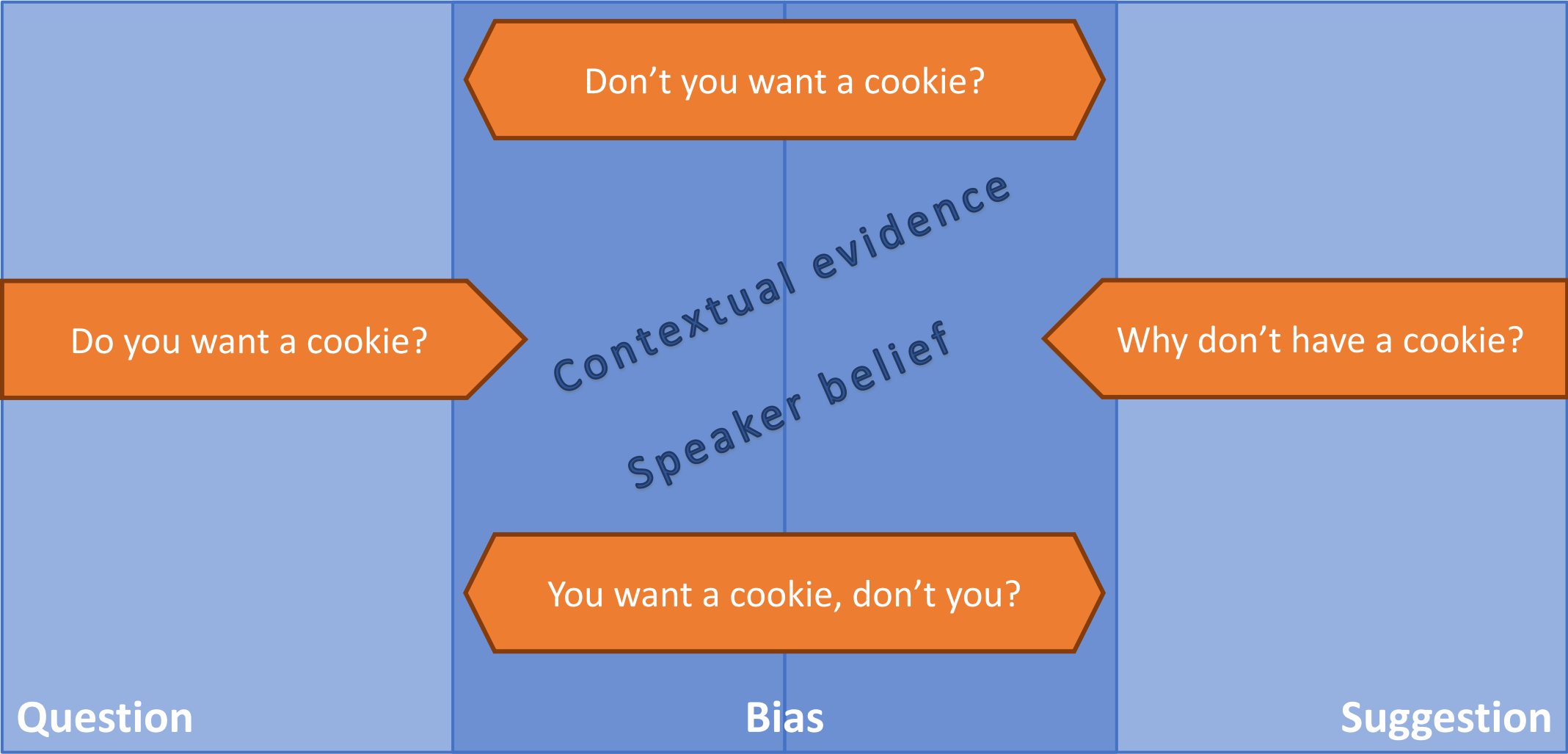
Any questions or feedback please email us at johannes.heim@abdn.ac.uk.

Key data: Negative questions

A stack of four cookies is shown in the background, slightly out of focus. The cookies are round and appear to be chocolate chip or similar. They are stacked on a light blue surface. The top cookie is partially broken, and some crumbs are visible. The stack is positioned in the center-right of the frame.

- (1) Do you want a cookie? Positive Polar Question (PosQ)
- (2) You want a cookie, **don't** you? Negative Tag Question (TagQ)
- (3) **Don't** you want a cookie? Negative Polar Question (NegQ)
- (4) Why **don't** you have a cookie? Why-don't-you Question (WhyQ)

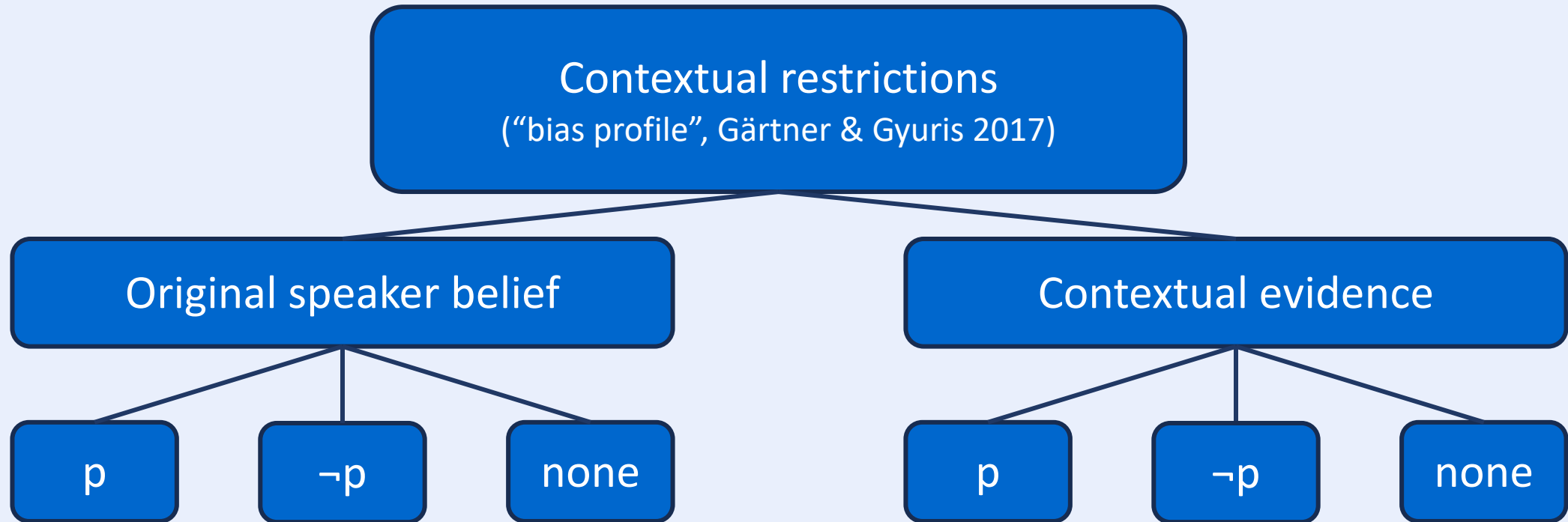
At the negotiation table (see Farkas & Bruce 2010)



Roadmap

- Key data
- Background
 - Negotiating evidence vs speaker belief
 - Multimodal cues and meaning
- Research questions
- Dataset and annotation
- Results
- Discussion

Acts of Negotiation



Speech Act Profile

	Commitment	Source	Engagement
PosQ	None (p vs $\neg p$)	A-belief	Resolve (p vs $\neg p$)
TagQ	Some ($p > \neg p$)	S-belief vs A-belief	Confirm p
BiasQ	Some ($\neg p > p$)/($\neg p > p$)	S-belief vs Context	Confirm $p/\neg p$
WhyQ	full ($p!$)	S-belief	Bring about p

Beyssade&Marnadin 2006, Gunlogson 2008, Rudin 2018, Heim 2019

Speech Act Profile

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TagQ	Some (p > \neg p)	S-belief vs A-belief	Confirm p
BiasQ	Some (\neg p > p)/(\neg p > p)	S-belief vs Context	Confirm p/ \neg p
WhyQ	full (p!)	S-belief	Bring about p

Multimodal distinction of commitment levels?

Multimodal distinction of CoAs?

Multimodal distinction of polarity?

Multimodal distinction of Belief vs Context?

Co-speech gestures signalling speech acts

- **Affirmation** → Head nod (Jakobsen 1972, Puuponen et al. 2015, Jabeen et al 2022a,b, Loos & Repp 2024)
- **Rejection**
 - Head nod (Li et al., 2016, González-Fuente et al. 2015, Loos & Repp 2024)
 - Head shake (Kendon 2002, Pfau 2015)
 - Brow raising or furrowing (Li et al., 2016, Loos & Repp 2024)
 - Shoulder shrugging (Li et al., 2016, González-Fuente et al. 2015)
- **Question**
 - Hand raising (Krahmer & Swerts 2005)
 - (High) brow raising (polar) (Krahmer & Swerts 2005, Žygis et al. 2023)
 - Brow furrowing (wh) (Hömke et al. 2022)
 - Medial portion of brows raised and pulled together (Domaneschi et al. 2016)
 - Addressee-directed gaze (Borras-Comes et al. 2014)
- **Exclamation**
 - Very high brow raising (Žygis et al. 2023)
 - Wide eye opening (Žygis et al. 2023)

Co-speech gestures signalling attitudes/belief states

- **Incredulity**
 - brow furrowing (Crespo-Sendra et al 2013, Żygis et al. 2023)
 - eyelid closure (Crespo-Sendra et al 2013)
 - Mano a tulipano manual (Poggi 2010, Ippolito et al. 2022)
- **Uncertainty**
 - brow furrowing (Krahmer & Swerts 2005, Roseano et al 2016, Brown and Prieto 2021)
 - eye squinting (ibid.)
 - shoulder shrugging (ibid.)
 - palm-up (epistemic) gesture (Cooperrider et al., 2018)
- **Source of evidence** → pointing (Roseano et al 2016)
- **Negation**
 - headshakes (Pfau 2015, Puupponen 2019, Kendon 2002, Harrison 2024)
 - lowered eyebrows, pressed lips (Benitez-Quiroz et al. 2016)

Expected multimodal cues

PosQ: raised eyebrows, raised hands, open palms

→ uncertainty, questionhood

TagQ: head nods or shakes, raised eyebrows, open palms

→ negation, rejection, questionhood

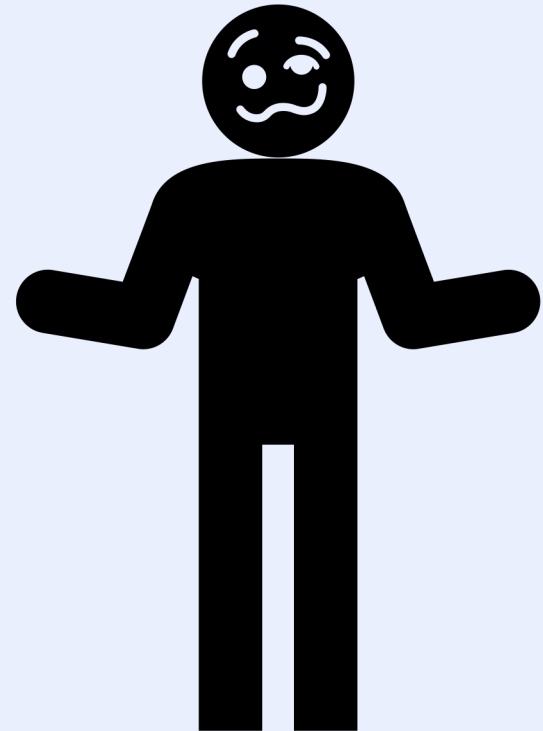
→ possibly converse cues in anchor and tag

NegQ: head nods or shakes, raised eyebrows, open palms

→ negation, rejection, questionhood

WhyQ: head nods or shakes, relaxed brows

→ affirmation, negation, lack of questionhood



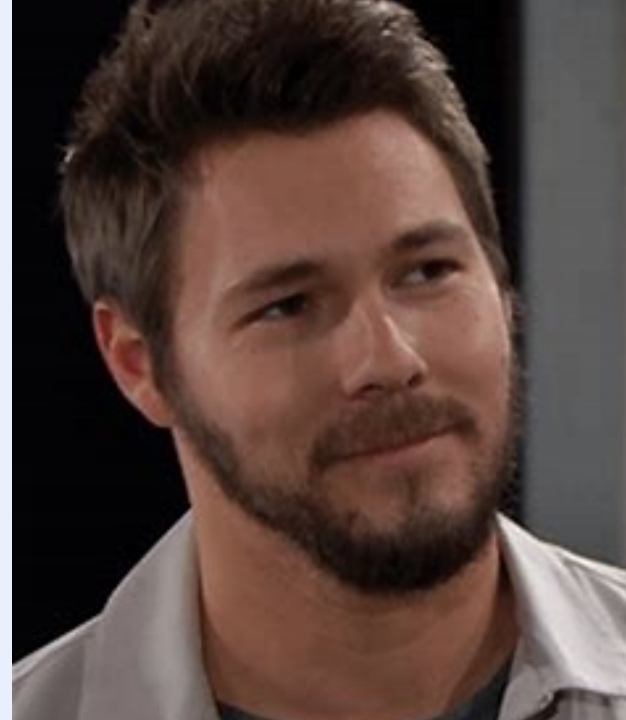
Research questions

- What co-speech gestures accompany:
 - response-seeking **NegQs**?
 - response-seeking **TagQs**?
- Do these biased types have a different gesture profile from:
 - neutral response-seeking **PosQs**? (a neutral question type)
 - non-response-seeking (suggestion) **WhyQs**?

The dataset

The Bold and the Beautiful (2010-2020)

- 4 actors (Bill, Brooke, Hope, Liam)
- 80 questions per actor (20 of each type)
- Event-based annotated using an adaptation of M3D guidelines (Rohrer et al 2023)
 - Hand shape/trajectory
 - Palm orientation
 - Beatlikeness
 - Head movement/shake
 - Brows movements



The dataset

~ 4.5 million words across 10 seasons

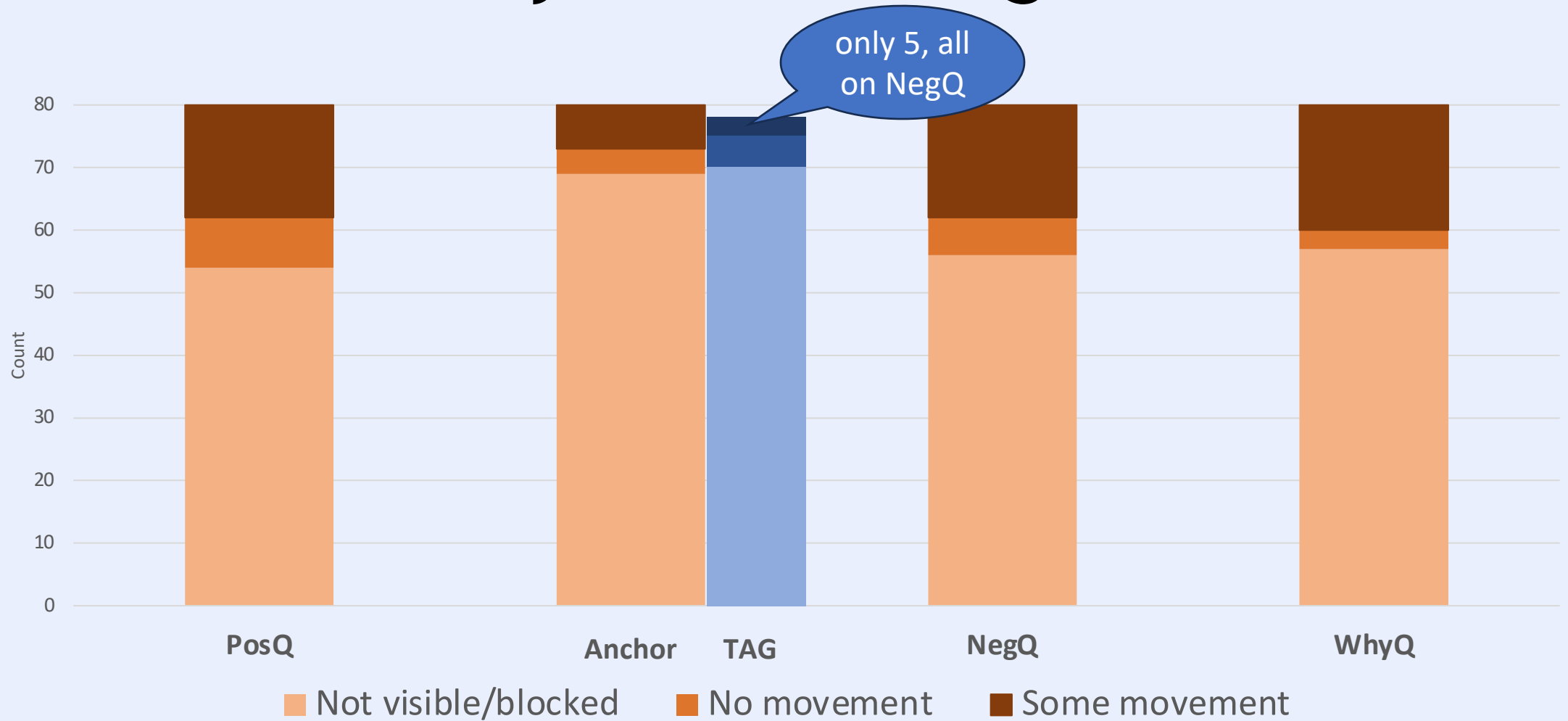
Exclusion process (preference for head visibility):

Total			Hands			Head		
overall finds	suitable	viewed	Yes	NV	NM	Yes	NV	NM
964	521	565	120	349	102	379	48	145

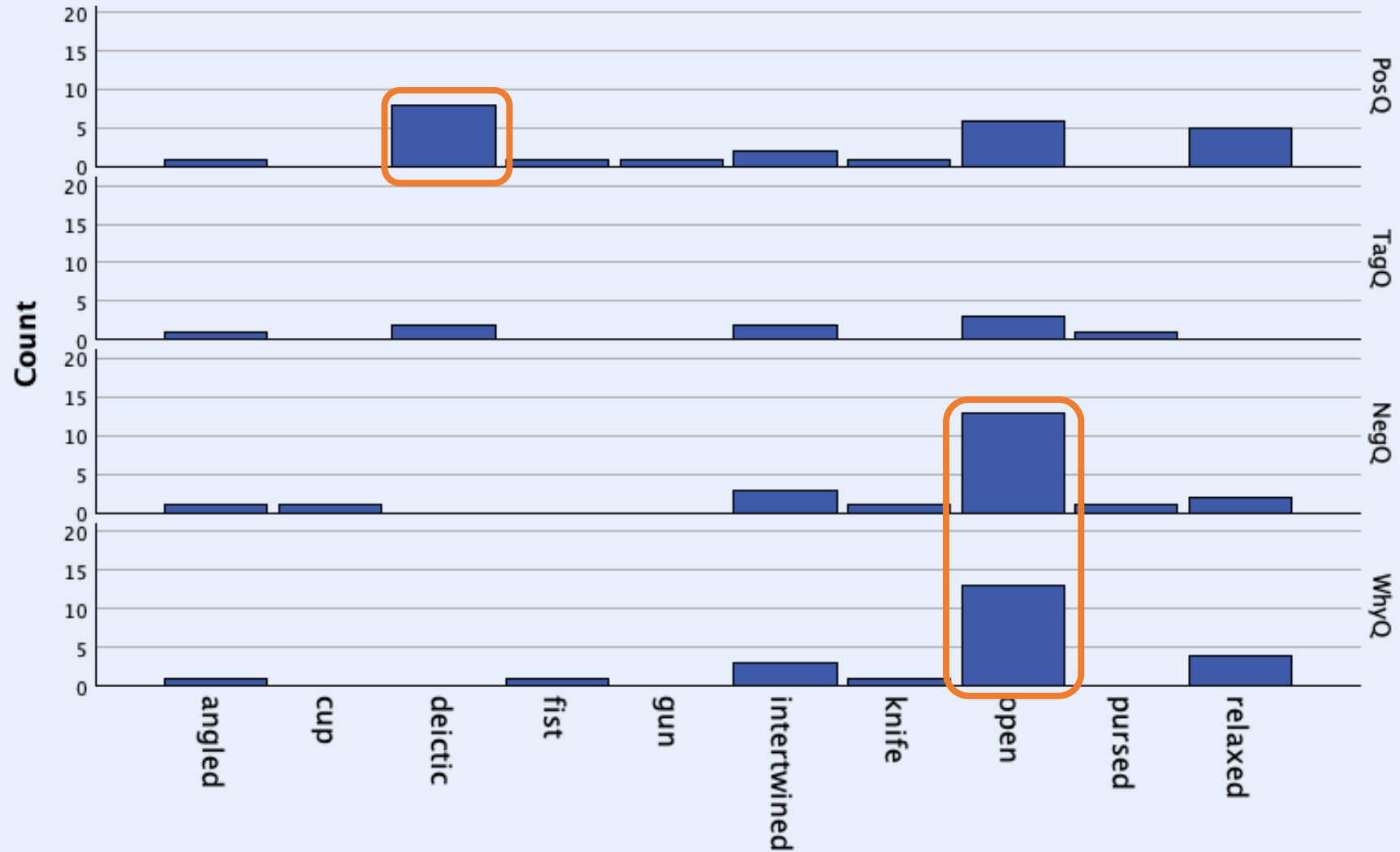
Distribution of selections across Q-types and gesture events:

	Total	Event 1	Event 2	Event 3	Event 4+	TAGs
PosQ	115	80	24	8	3	-
TagQ	197	80	26	9	4	78
NegQ	177	80	50	25	21	-
WhyQ	129	80	31	14	5	-

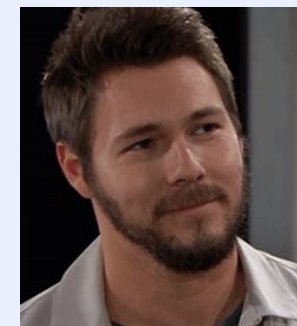
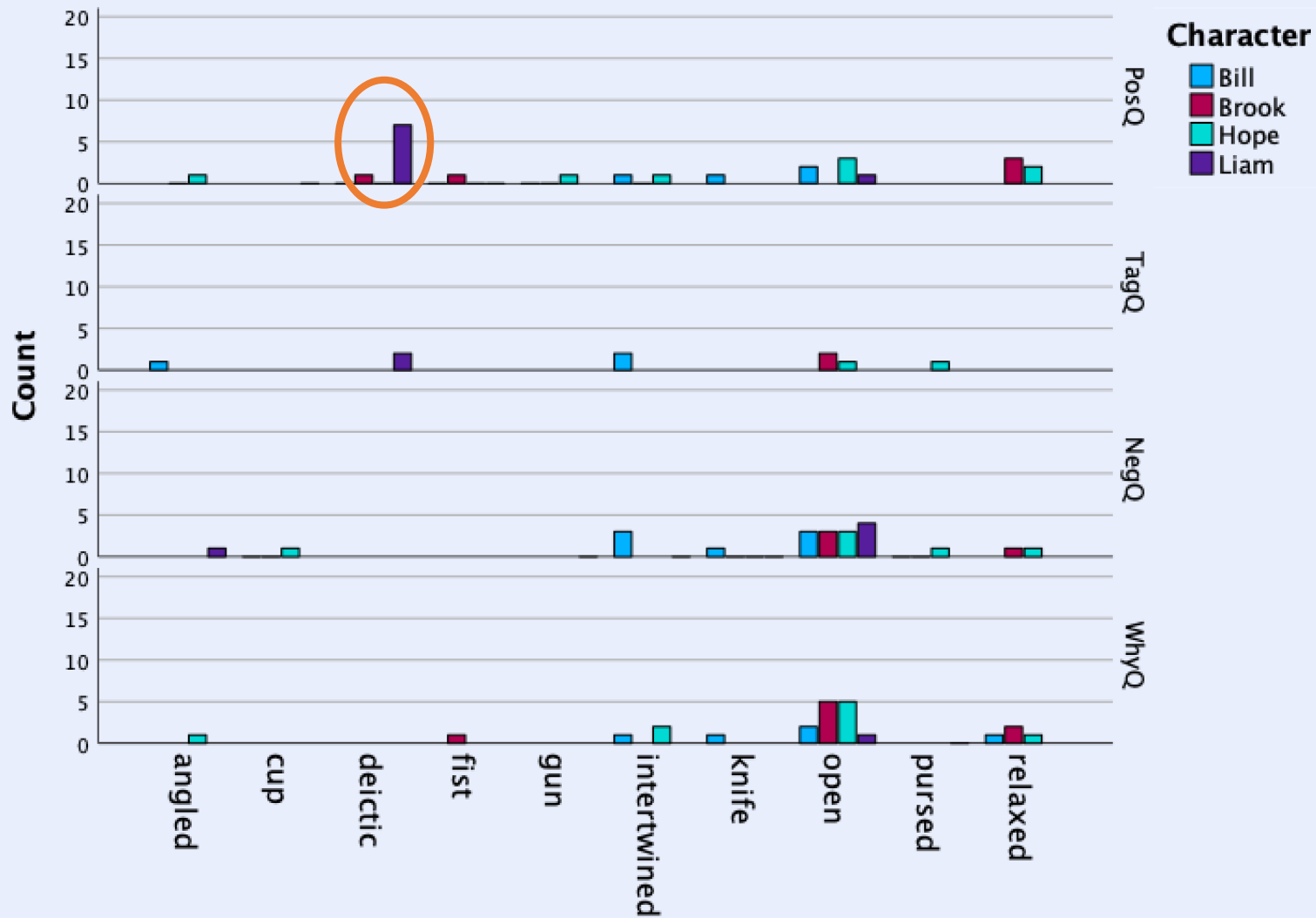
Visibility of manual gestures



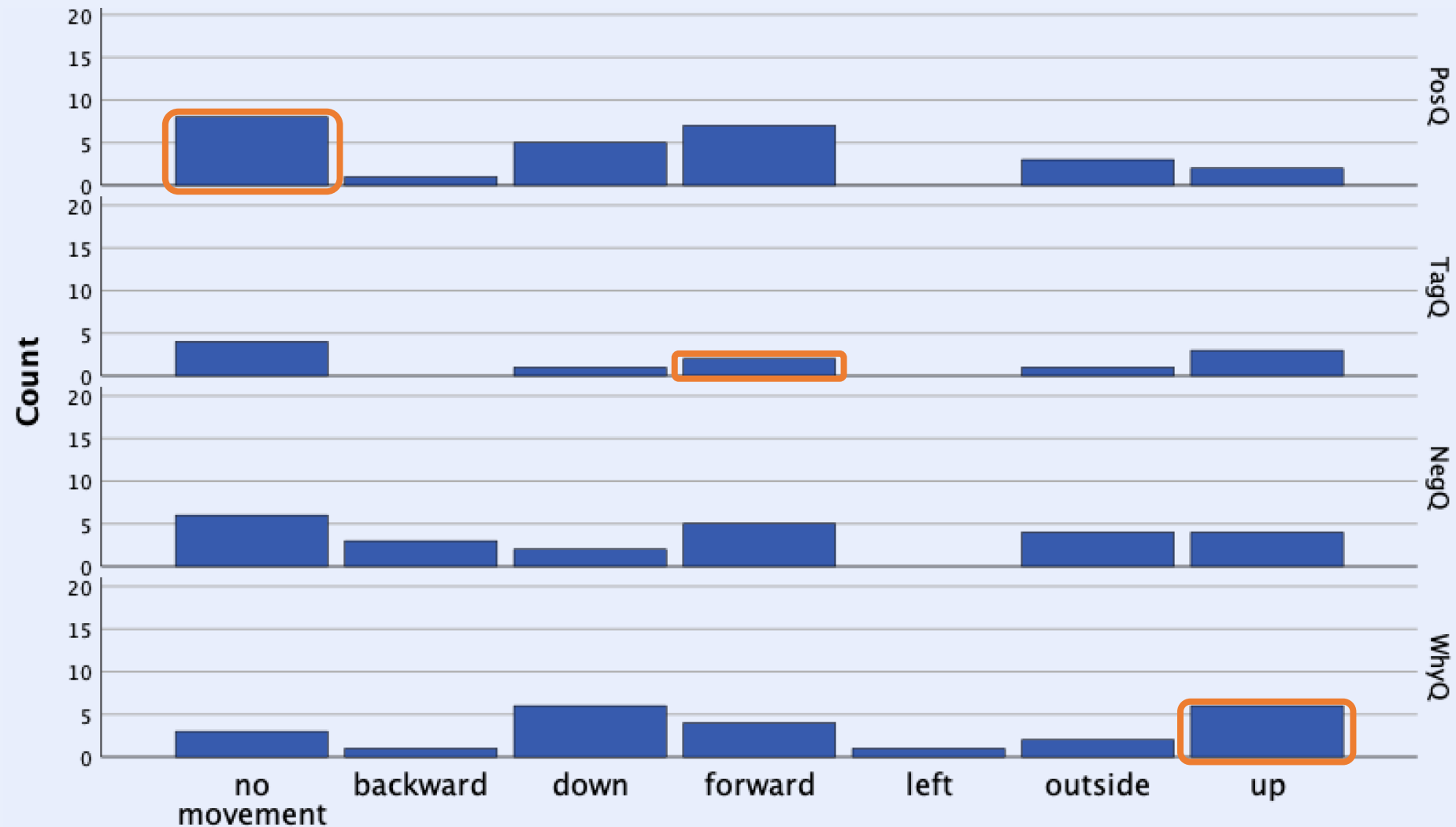
Results: Shape of dominant hands



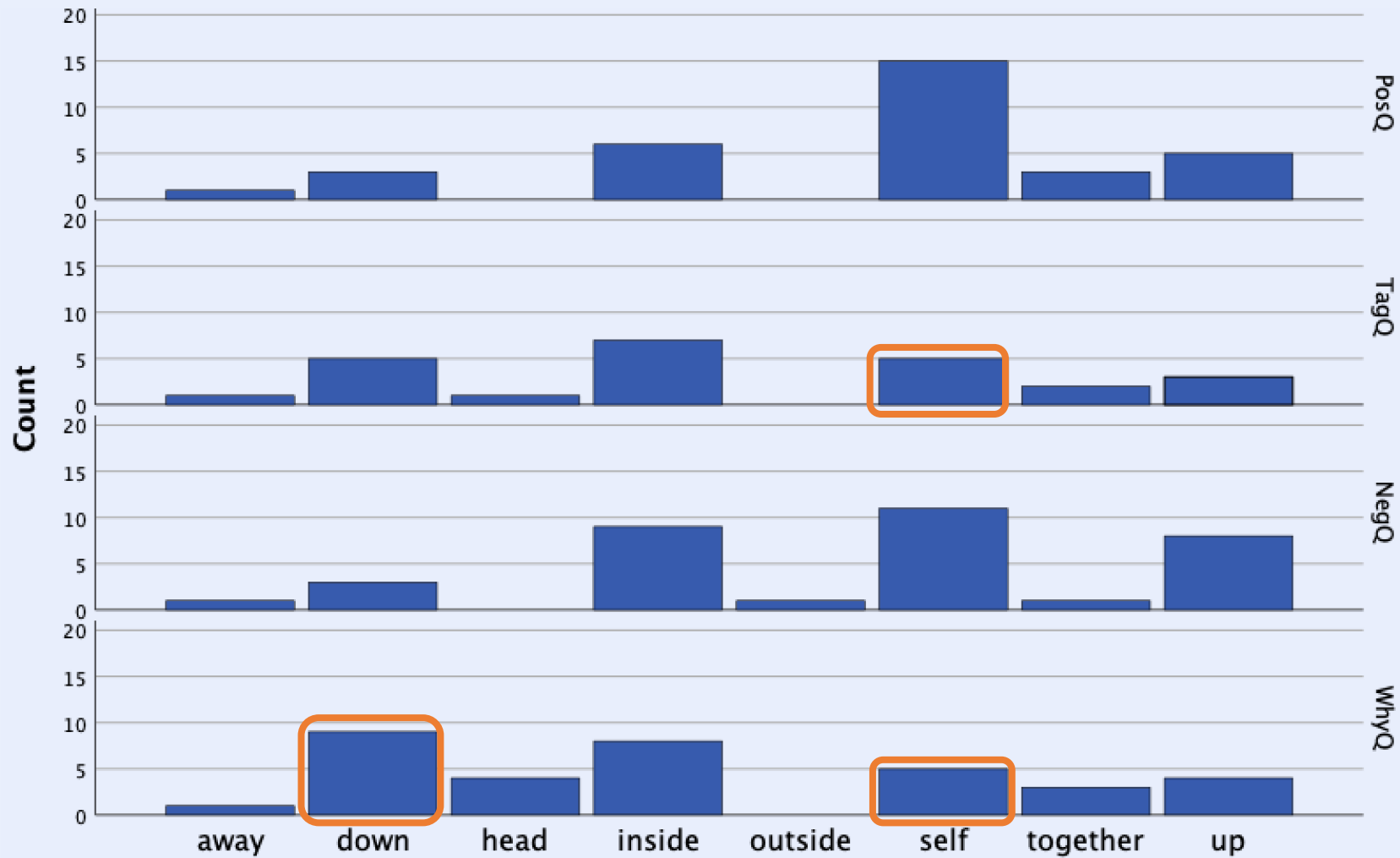
Results: Shape of dominant hand by actor



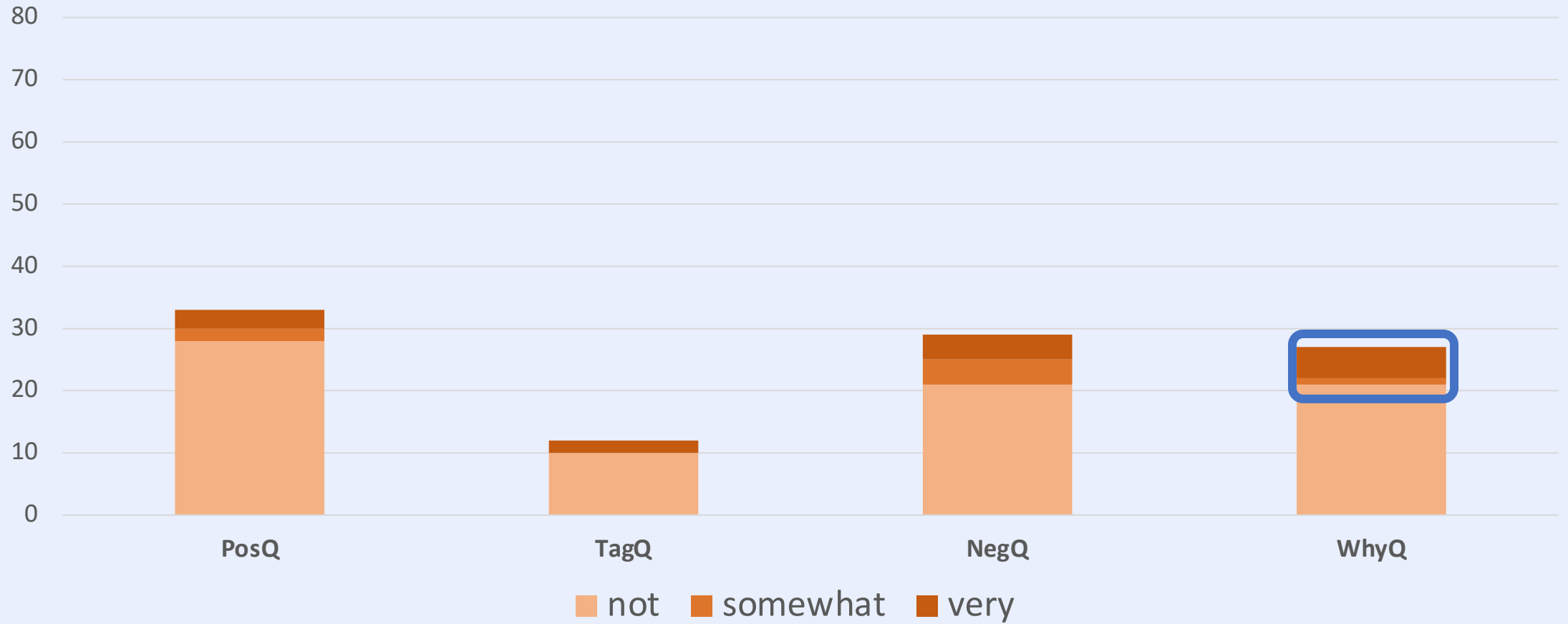
Results: Trajectory of dominant hand



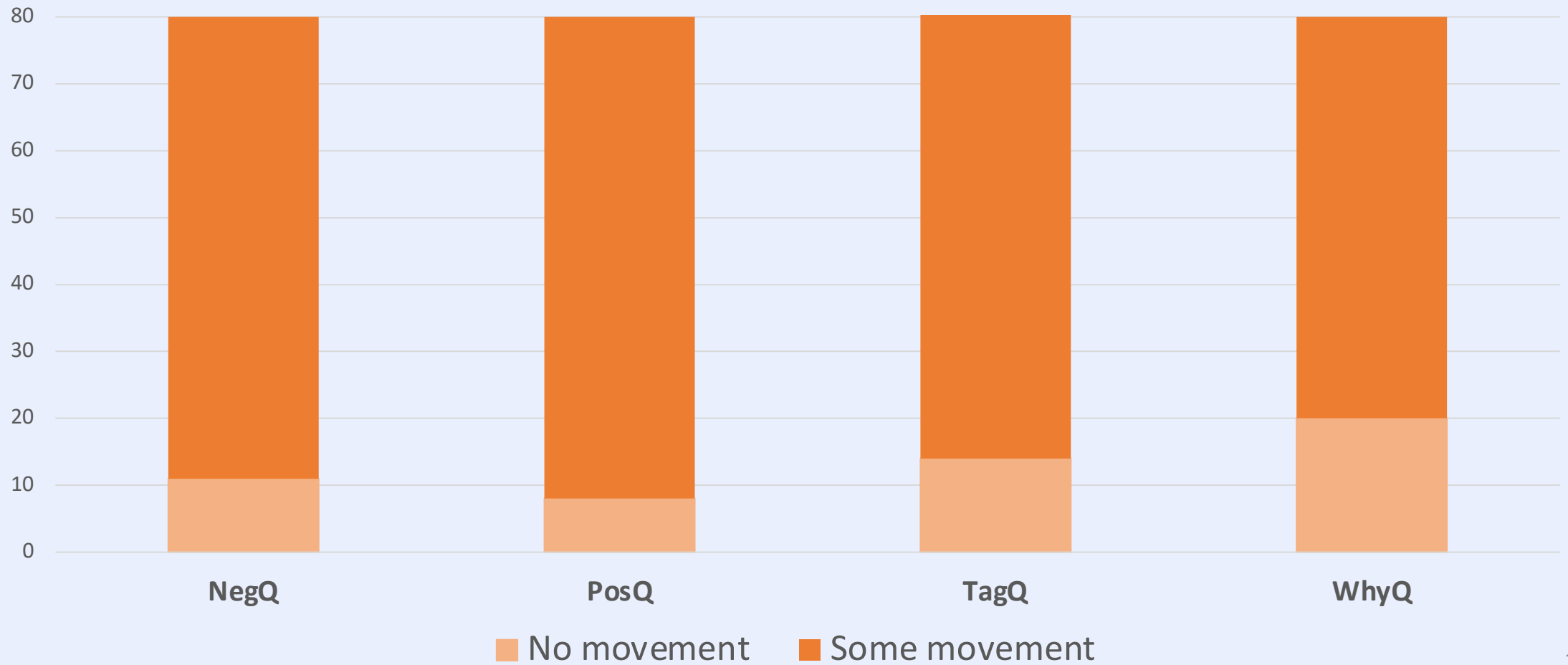
Results: Palm orientation of dominant hand



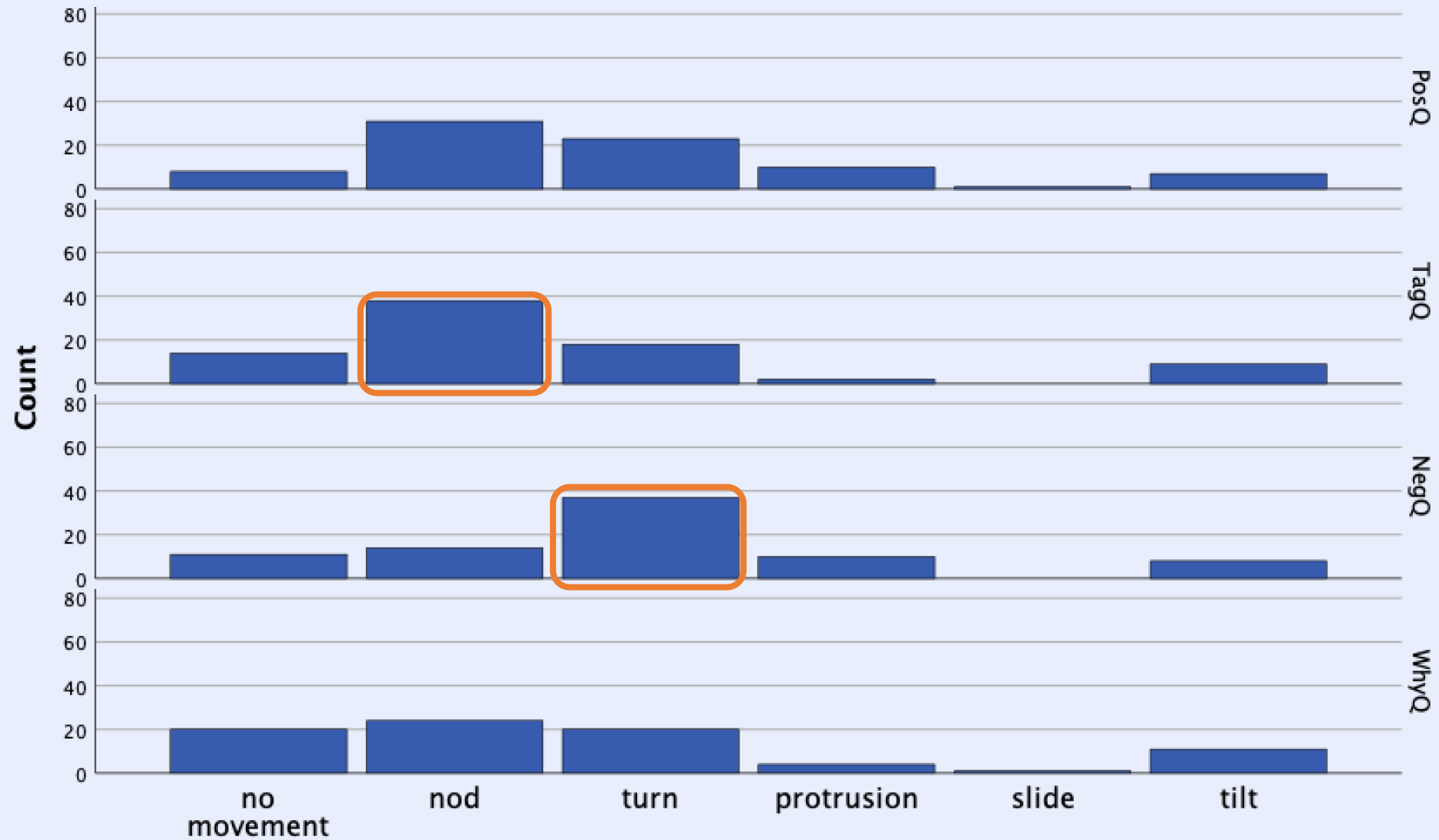
Results: Beatlikeness



Head movements

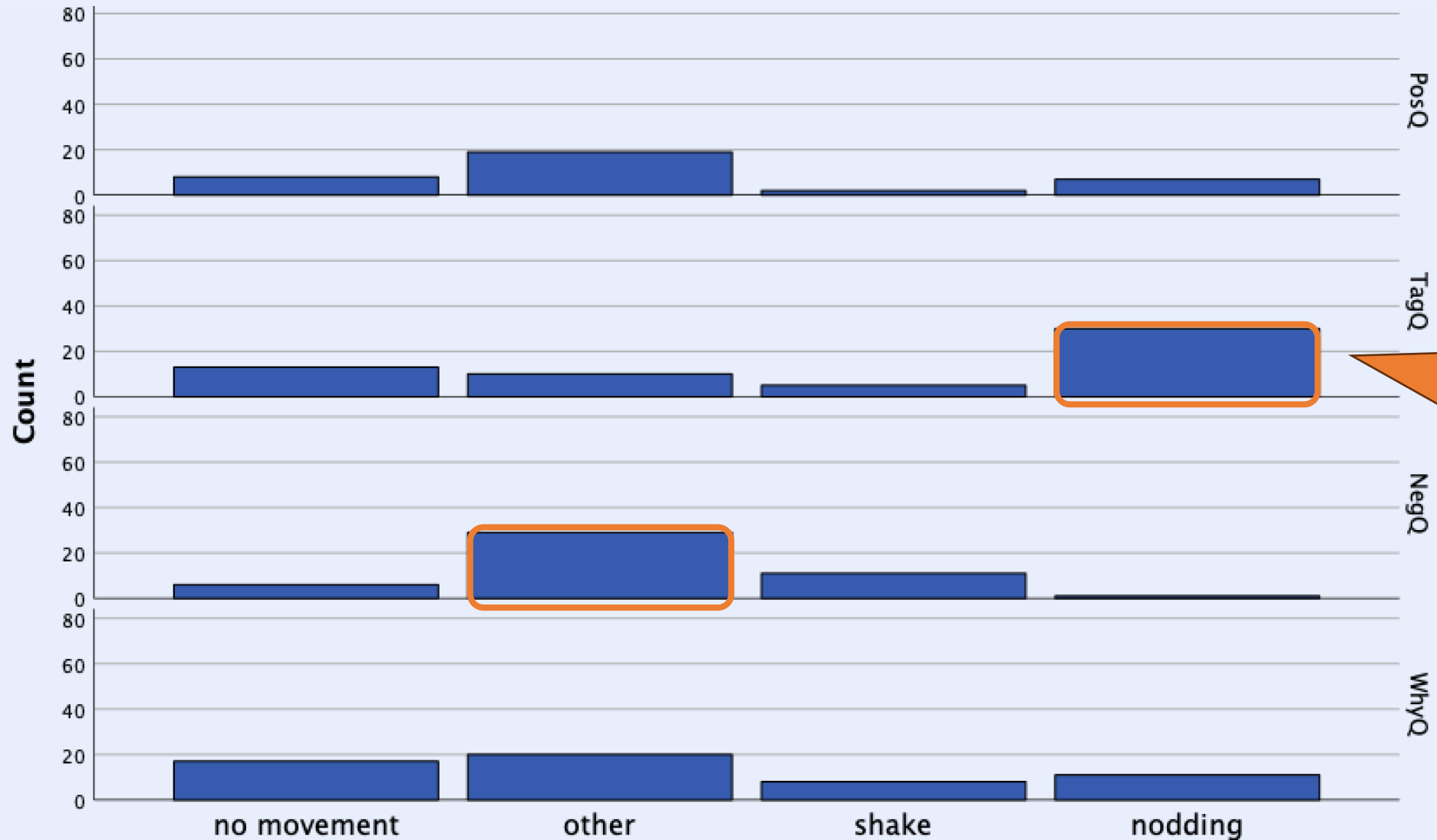


Results: Head movement



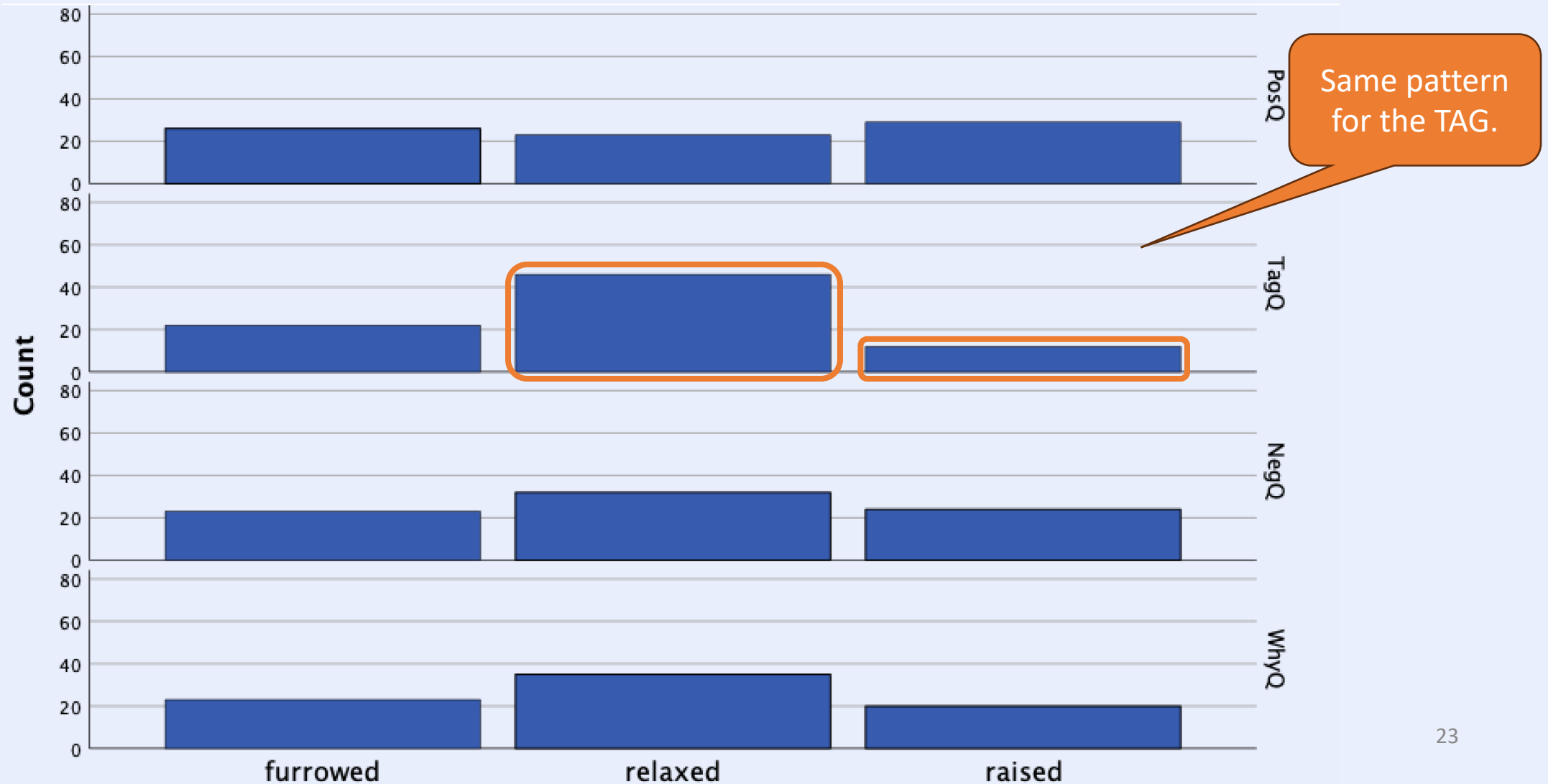


Results: Head shake



Same pattern for the TAG.

Results: Brow movement



Which multimodal cues stand out?

- **Positive questions:** few hand movements, self-oriented palms, somewhat beat-like, nods, no specific brow profile
- **Tag questions:** few forward hand movements, increased beatlikeness, many nods (which are repetitive), brows are usually relaxed
- **Negative questions:** open hands, most beatlike and most gestural activity across the four questions, many horizontal head turns
- **Why questions:** vertical hand movement with self-/downward facing palms, no distinct head/brow profile

Discussion

- **Positive questions:** few hand movements, self-oriented palms, somewhat beat-like, nods, no specific brow profile
 - no specific SA markers unlike what is reported elsewhere
- **Tag questions:** few forward hand movements, many nods (which are repetitive), brows are usually relaxed, increased beatlikeness
 - absence of question cues is notable; TAGs resemble anchors
- **Negative questions:** open hands, most beatlike and most gestural activity across the four questions, many horizontal head turns
 - beatlikeness and horizontal head turns as unexpected bias marker in NegQ?
- **Why questions:** vertical hand movement with self-/downward facing palms, no distinct head/brow profile
 - absence of question cues; hands and palms in strong contrast to PosQ

Conclusion

- While the 4 question types have different multimodal profiles, it is difficult to associate individual cues with these types
- Beatlikeness and head movement seem promising leads
- Sometimes, absence of movement is noteworthy (TagQ!)
- Cues for negativity/rejection were rare
- Biased Qs (NegQ & TagQ) have increased gestural activity
- Biased Qs are rare and elusive in (scripted) conversation

Thank you!

- Annotators for bearing with our revisions of the coding scheme
- B&B fanbase for transcribing years' worth of episodes
- Organizers of AG5 for this timely and important workshop
- Participants of AG5 for listening and feedback

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