**Smart motor: objects and others / perspectives**

**Simulations of body in action**

Shapiro: Special Contribution Story --- embodiment consists in mind containing, and using, simulations of body in action;

**PLAN D’ATTAC**

1. **More sources: steve search for something developmental on goals**
2. **Think about figures** (steve to extend model from Paris to extend not just beliefs but also object cognition)

**PAPERS TO MODEL OUR TICS UPON:**

**Heyes, C., Chater, N., & Dwyer, D.M. (2020). Opinion - Sinking in: The peripheral Baldwinisation of human cognition. *Trends in Cognitive Sciences, 24*, 884-899.** [**https://doi.org/10.1016/j.tics.2020.08.006**](https://doi.org/10.1016/j.tics.2020.08.006)

**Scholl, B.J., & Tremoulet, P.D. (2000). Review - Perceptual causality and animacy. *Trends in Cognitive Sciences, 4*, 299-309.** [**https://doi.org/10.1016/S1364-6613(00)01506-0**](https://doi.org/10.1016/S1364-6613(00)01506-0)

**STUDIES WE DO NOT UNDERSTAND YET**

Bub, D.N., Masson, M.E.J., & van Noordene, M. (2020). Motor representations evoked by objects under varying action intentions. *Journal of Experimental Psychology: Human Perception and Performance*. Advance online publication.<https://doi.org/10.1037/xhp0000876>

**STUDIES ON POSSIBILITY OF MOTOR MINDREADING**[JL1]

Zani, G., Butterfill, S.A., & Low, J. (2020). Mindreading in the balance: adults' mediolateral leaning and anticipatory looking foretell others' action preparation in a false-belief interactive task. **Royal Society Open Science, 1**, 19167. <https://doi.org/10.1098/rsos.191167>

Edwards, K., & Low, J. (2017). Reaction time profiles of adults’ action prediction reveal two mindreading systems. **Cognition, 160**, 1-16.<https://doi.org/10.1016/j.cognition.2016.12.004>

**Bub, D.N., Masson, M.E.J., & van Noordene, M. (2020). Motor representations evoked by objects under varying action intentions. *Journal of Experimental Psychology: Human Perception and Performance*. Advance online publication.** [**https://doi.org/10.1037/xhp0000876**](https://doi.org/10.1037/xhp0000876)

\*\*\* Reinecke, R, Nazir, T.A., Carvallo, S., & Jayes, J. (2020, unpublished). Factives at hand: When presupposition mode affects motor response.<https://www.researchgate.net/publication/343836806_Factives_at_hand_When_presupposition_mode_affects_motor_response>[JL2]

They see this as about linguistics. We see it as influence of perspective taking on motor processes.

**STUDIES THAT CONSTRAIN AGENT**

Low, J., Edwards, K., & Butterfill, S.A. (2020). Visibly constraining an agent modulates observers' automatic false-belief tracking. **Scientific Reports, 10**, 11311.<https://doi.org/10.1038/s41598-020-68240-7>

Ward, E., Bach, P., McDonough, K., & Ganis, G. (2020, unpublished). Is implicit Level-2 visual perspective taking embodied? Perceptual simulation of others’ perspectives is not impaired by motor restriction.<https://doi.org/10.31234/osf.io/84q7g> [JL3]

Schmitz, L., Vesper, C., Sebanz, N., & Knoblich, G. (2017). Co-representation of others’ task constraints in joint action. **Journal of Experimental Psychology: Human Perception and Performance, 43**, 1480–1493.<https://doi.org/10.1037/xhp0000403>

‘unconstrained actors represented their coactor’s task constraint and adjusted their own actions accordingly, particularly under high coordination demands. The findings also showed that unconstrained actors represented the object property constraining their coactor’s movement rather than parameters of this movement’ --- similar to our smurf findings insofar as in both cases, constraints on the agent are reflected in the action performance of the observer.

Fini, C., Brass, M., & Committeri, G. (2015). Social scaling of extrapersonal space: Target objects are judged as closer when the reference frame is a human agent with available movement potentialities. **Cognition, 134**, 50–56.<https://doi.org/10.1016/j.cognition.2014.08.014> [JL4]

**STUDIES THAT CONSTRAIN (or ENHANCE) OBSERVER**

Rivière, James, and Roger Lécuyer. ‘Effects of Arm Weight on C-Not-B Task Performance: Implications for the Motor Inhibitory Deficit Account of Search Failures’. *Journal of Experimental Child Psychology* 100, no. 1 (1 May 2008): 1–16.<https://doi.org/10.1016/j.jecp.2008.01.005>.

--- developmental: constraining infant *improves* performance (Strong evidence of effect of motor on cognition)

Toussaint, L., Wamain, Y., Bidet-Ildei, C., & Coello, Y. (2020). Short-term upper-limb immobilization alters peripersonal space representation. **Psychological Research, 84,** 907–914.<https://doi.org/10.1007/s00426-018-1118-0>

Donno, B., Migliorati, D., Zappasodi, F., Perrucci, M.G., & Costantini, M. (2020). The impact of body posture on intrinsic brain activity: the role of beta power at rest. *PLOS ONE, 15*, e0218977.<https://doi.org/10.1371/journal.pone.0218977>

Quarona, D., Radduzzi, M., Costantini, M., & **Sinigaglia, C.** (2020). Preventing action slows down performance in perceptual judgement. *Experimental and Brain Research, 238*, 2857-2864. [low priority]

Costantini, Marcello, Luca Tommasi, and Corrado Sinigaglia. ‘How Action Performance Affects Object Perception’. Experimental Brain Research 237, no. 7 (1 July 2019): 1805–10. https://doi.org/10.1007/s00221-019-05547-6.

Effect of action performance on judgements about objects.

Yeung, H. Henny, and Mark Scott. ‘Postural Control of the Vocal Tract Affects Auditory Speech Perception’. Journal of Experimental Psychology: General, 2020, No Pagination Specified-No Pagination Specified. https://doi.org/10.1037/xge0000990.

(postural, contrasted with motor)

**STUDIES THAT EXAMINE AGENT-OBSERVER MOTOR SIMILARITY**

De Marco, D., Scalona, E., Bazzini, M.C., Avanzini, P., & Fabbri-Destro, M. (2020). Observer-agent kinematic similarity facilitates action intention decoding. **Scientific Reports, 10**, 2605.<https://doi.org/10.1038/s41598-020-59176-z>

Pavlidou, A., Gallagher, M., Lopez, C., & Ferrè, E.R. (2019). Let’s share our perspectives, but only of our body postures match. *Cortex, 119*, 575-579.<https://doi.org/10.1016/j.cortex.2019.02.019> [this might be the leading illustration of our view]

Erle, Thorsten Michael. ‘Level-2 Visuo-Spatial Perspective-Taking and Interoception – More Evidence for the Embodiment of Perspective-Taking’. PLOS ONE 14, no. 6 (27 June 2019): e0219005. https://doi.org/10.1371/journal.pone.0219005. [also good but prioritise Pavlidou et al]

Casartelli, L., Federici, A., Fumagalli, L., Cesareo, A., Nicoli, M., Ronconi, L., Vitale, A., Molteni, M., Rizzolatti, G., & Sinigaglia, C. (2020). Neurotypical individuals fail to understand action vitality form in children with autism spectrum disorder. *Proceedings of the National Academy of Sciences USA, 117(44)*, 27712 – 27718.<http://doi.org/10.1073/pnas.2011311117>. [‘This has led to the hypothesis that observing someone else acting with a given vitality form would involve a transformation of the sensory information concerning the observed action into processes and representations which would occur if the observers were expressing that vitality form themselves. If the observed actions match the internal representation of corresponding vitality forms, this would allow the observers to recognize them as well as to track the related mood or affective states’]

**ARGUMENTS AGAINST IMPORT OF MOTOR REPRESENTATIONS**

**Vannuscorps, G., Andres, M., & Caramazza, A. (2020). Efficient recognition of facial expressions does not require motor simulation. *Elife, 9*, e54687.** [**http://doi.org/10.7554/eLife.54687**](http://doi.org/10.7554/eLife.54687)

**Vannuscorps, G., & Caramazza, A. (2017). Typical predictive eye movements during action observation without effector-specific motor simulation. *Psychonomic Bulletin & Review, 24*, 1152–1157.** [**https://doi.org/10.3758/s13423-016-1219-y**](https://doi.org/10.3758/s13423-016-1219-y)

**STUDIES THAT EXAMINE AGENT-OBSERVER POSTURAL SIMILARITY**

**RECENT THEORETICAL WORKS**

Shapiro, L.A. (2019). Flesh matters: the body in cognition. **Mind & Language, 34**, 3-20.<https://doi.org/10.1111/mila.12203>

‘Whether the body's contribution to cognition is special depends not on whether it is a constituent in cognitive processes but whether these processes have evolved to exploit the body's features in the course of their normal operations.’

[JL1]Is this term too restrictive to reach wide audience? Also how many “mindreading” papers will there be?

[JL2]Unpublished work is risky to consider.

[JL3]Again, unpublished, but it seems useful to have a paper that will challenge us.

[JL4]This is not technically about mindreading. Do we need to relax our title to be less specific to theory of mind considerations? Also, is 2015 too old?

**ARGUMENTS AGAINST IMPORT OF MOTOR REPRESENTATIONS**

Vannuscorps, G., Andres, M., & Caramazza, A. (2020). Efficient recognition of facial expressions does not require motor simulation. *Elife, 9*, e54687.<http://doi.org/10.7554/eLife.54687>

Vannuscorps, G., & Caramazza, A. (2017). Typical predictive eye movements during action observation without effector-specific motor simulation. *Psychonomic Bulletin & Review, 24*, 1152–1157.<https://doi.org/10.3758/s13423-016-1219-y>

**QUOTES / IDEAS**

Why should the motor system be involved in these cases. [Shapiro, 2019]: Cognitive ‘processes have evolved to exploit the body's features in the course of their normal operations’ and this to such an extent that bodily constraints predictably impair spatial and social cognition. This explains why the motor system should be involved. It enables exploiting the body’s features.

What is the role of your body in your spatial and social cognition?

**POSSIBLE MODEL FOR ABSRTACT SUBJECT TO JASON’S APPROVAL**

‘Certain simple visual displays consisting of moving 2-D geometric shapes can give rise to percepts with high-level properties such as causality and animacy. This article reviews recent research on such phenomena, which began with the classic work of Michotte and of Heider and Simmel. The importance of such phenomena stems in part from the fact that these interpretations seem to be largely perceptual in nature – to be fairly fast, automatic, irresistible and highly stimulus driven – despite the fact that they involve impressions typically associated with higher-level cognitive processing. This research suggests that just as the visual system works to recover the physical structure of the world by inferring properties such as 3-D shape, so too does it work to recover the causal and social structure of the world by inferring properties such as causality and animacy.’ (Scholl, B. J. and Tremoulet, P. D. (2000). Perceptual causality and animacy. Trends in Cognitive Sciences, 4(8):299–309.)

The motor system works to recover the social and spatial structure of the world by inferring properties such as …