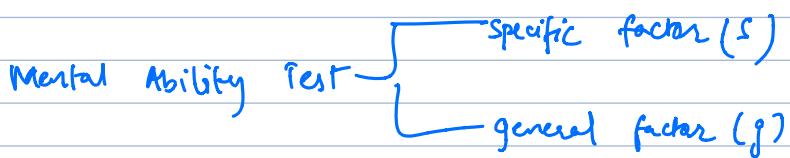


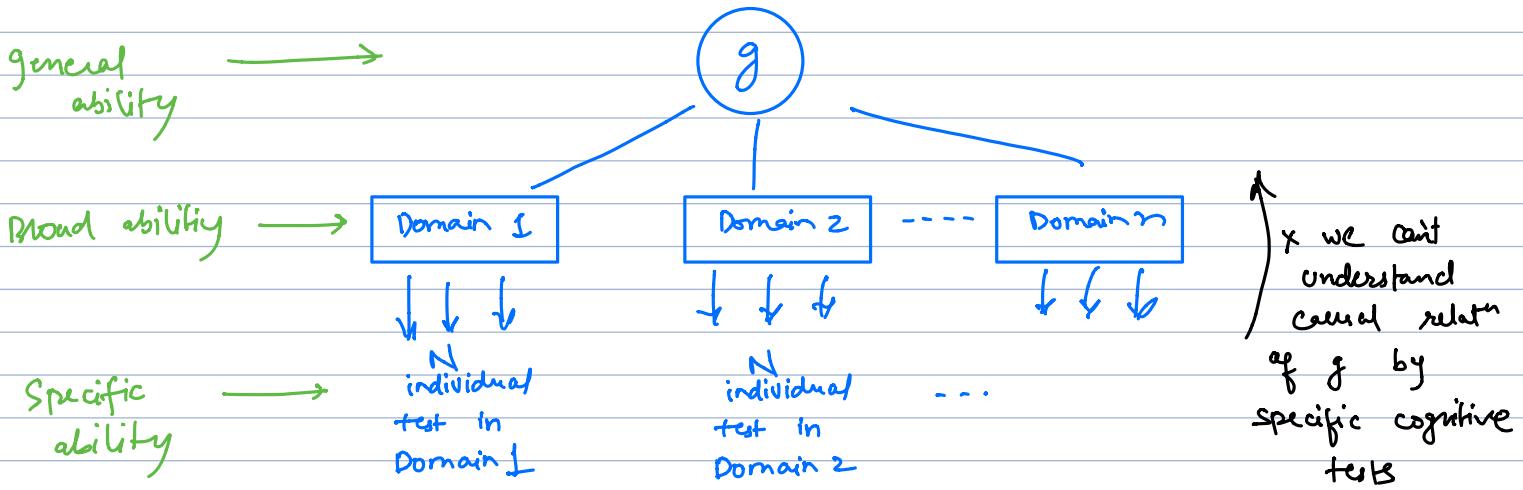
Symposia: A Global perspective on the Neural Basis of Intelligence - organizer: Pedro Valdes Sosa

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| Wednesday, 24 June |
| 10.00h - New York / 15.00h - London / 22.00h - Hong Kong |
| A Global Perspective on the Neural Bases of Intelligence |
| Organizer: Pedro Valdes Sosa |
| 1) Network Neuroscience Theory of Human Intelligence - Aron Barbey 2) Brain Activity Markers of Intelligence in Children: From intellectual disability to giftedness - Sarah Lippé 3) Gender Differences in Connectome-based Predictions of Individualized Intelligence Quotient and Sub-domain Scores - Jing Sui 4) Crystallized and Fluid Intelligence are Predicted by Microstructure of Specific White-matter Tracts - María Bringas Vega |

1) Spearman (1904): General factor (g) → represents component of individual differences variance that is common across all test of mental ability.



Cattell - Horn - Carroll Model



(Topic is interesting, but the speaker is boring, just reading from the screen, Ahh :()

2) EEG children - Lippé et al. Cerebral Cortex 2007, Neuroscience 2009, Birca et al. 2010, Lippé et al. 2009, 2011

Studies can be performed on children

- Habituation → e.g. sleep
- Repetition effect → brain response with repetition ↓
- Novelty effect → surprise! Brain ↑ amplitude

Adaptive Behavior Assessment → as a proxy of IQ

Babies with greater adaptive behaviours

- Greater power in sensory response and habituation (theta band) together with gamma enhancement with repetition.
- Repetition provides them with greater efficiency in processing sensory information (latency).
- They seemingly show greater learning of the sequence (less amplitude to local deviant).
- Compatible with precocious minds.

Lopez G, DeGuire F, Côté F, Agbogba K, Lippé S et al submitted

Because we can't measure IQ of infants

Children with high potentials

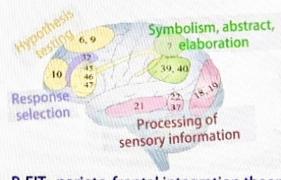
- Greater phase synchronisation to first standard stimuli.
- But less for change detection. However, they show an increase in gamma power.
- Increase in synchronisation depends on the stimulus type.

3) Started with IQ & Brain Imaging

Review of brain imaging IQ studies

- The prevailing comprehensive synthesis on intelligence: the parieto-frontal integration theory **P-FIT** (parieto-frontal regions, cingulate cortex, along with temporal and occipital regions).
- Recent work has suggested that intelligence is underpinned by communication between widespread brain regions including, but not limited to P-FIT areas.

The gender difference on IQ and its sub-domain prediction using brain imaging variables has not been fully studied.



P-FIT: parieto-frontal integration theory

Jung and Haier 2007, Behav Brain Sci ;

Deary et al., 2010, Nat Rev Neurosci

Discussion

- ◆ IQ can be predicted by using patterns of Functional Connectivity
- ◆ A relatively high-resolution parcellation contributes to the detection of individual variability and boosts identification rate
- ◆ for all the prediction results estimated with whole-brain features or solely based on several identified consensus FCs, females have more predictability than males
- ◆ the prevailing P-FIT implicated regions including SPL, IPL, prefrontal, STG and ITG were revealed as the fundamental features that are common across two gender groups, which underpins its crucial role in the biological basis of intelligence
- ◆ for female subjects, the predictive FCs concerned areas were mainly concentrated on fundamental P-FIT indicated regions. However, for males, lingua gyrus and some subcortical areas including amygdala, basal ganglia and thalamus were highlighted with more contributing power, apart from the P-FIT views
- ◆ significant gender specificity of biomarkers and gender-specific model were revealed

Look at her research for more info

4) Again, — " — — "