Effects of Personality and Executive Function on Feedback Based Learning

Hodgetts, James

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EFFECTS OF *PERSONALITY* AND *EXECUTIVE FUNCTION* ON *FEEDBACK BASED LEARNING*

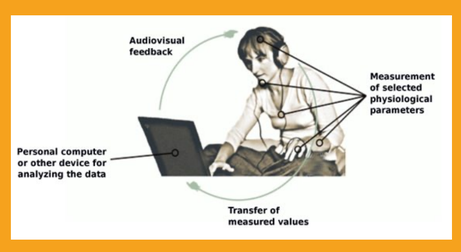
JAMES HODGETTS **(PHD STUDENT)**, DR ANDREW COOKE & DR GERMANO GALLICCHIO **(SUPERVISORS)**

PRIFYSGOL BANGOR UNIVERSITY

IPEP INSTITUTE FOR PSYCHOLOGY OF ELITE PERFORMANCE

INTRODUCTION:

- **What is biofeedback? -** technique to guide individuals to self regulate a certain physiological function using auditory/visual feedback. But not everyone responds to the intervention as intended.
- Physiological functions include heartbeat.
- The feedback is often auditory/ visual.
- Used in a variety of settings including clinical trials.



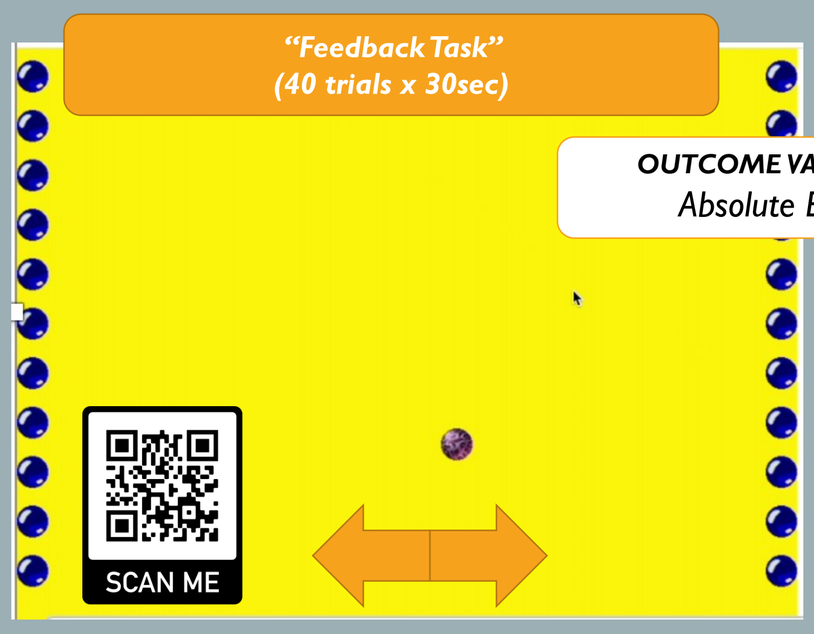
THE INEFFICACY PROBLEM:

- Research relating to Biofeedback the efficacy/inefficacy is disputed (Weber et al, 2011).

Responders

Non- Responders

- How prelevant is the issue? (Alkoby et al, 2018, Hanslmayr et al, 2005)
- So, how can we predict the proficiency of participants?



OUTCOME VARIABLE:
Absolute Error

Motivation

Personality Traits

Executive Function

Intrinsic Motivation

Extrinsic Motivation

Agreeableness
Conscientiousness
Extraversion
Emotional Stability
Openness
Alexithymia

Updating (N-Back)

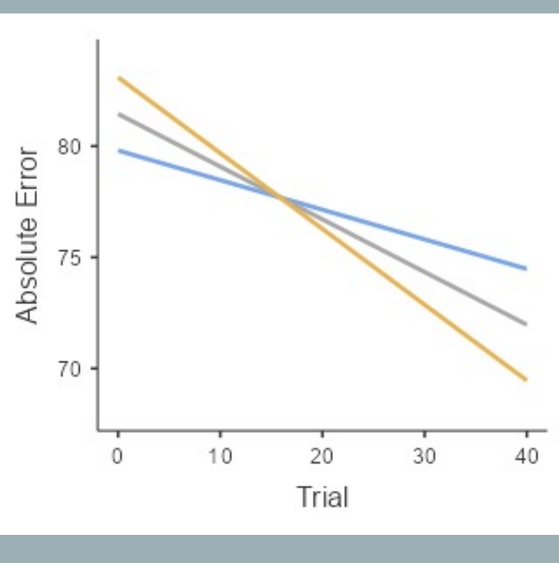
Shifting (Switching)

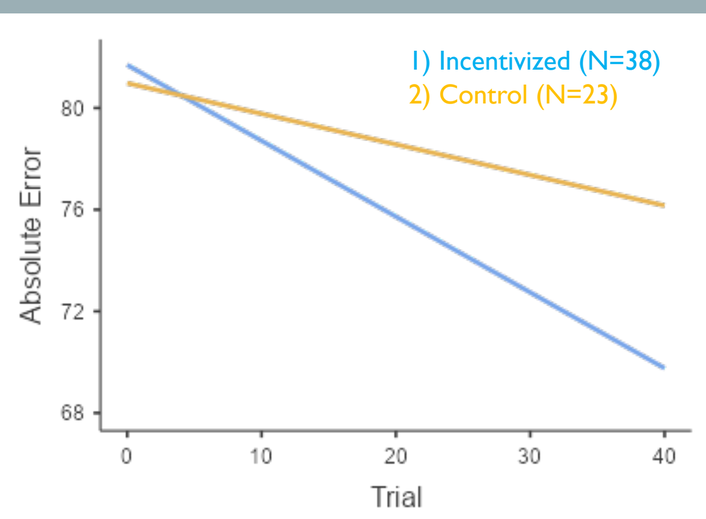
Inhibition (Flanker)

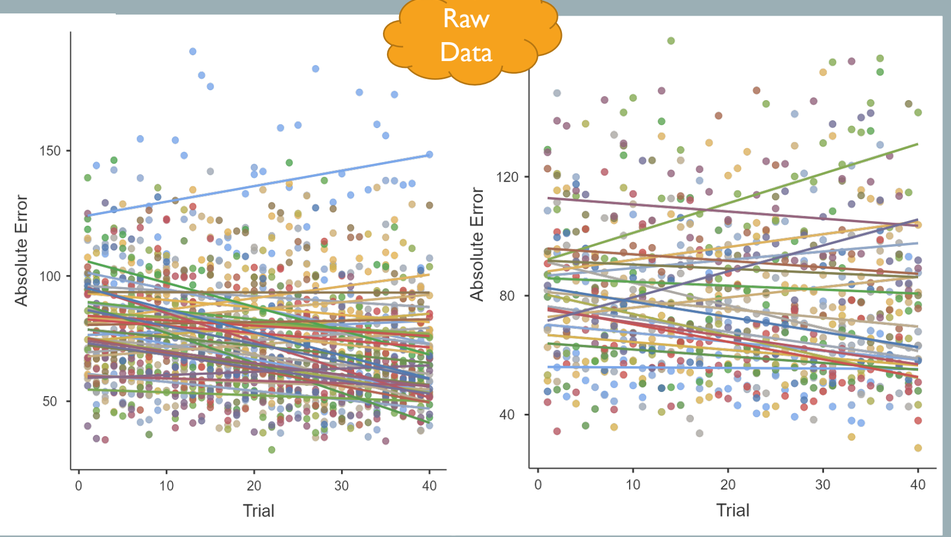
WORK IN PROGRESS (NOT YET ANALYSED)

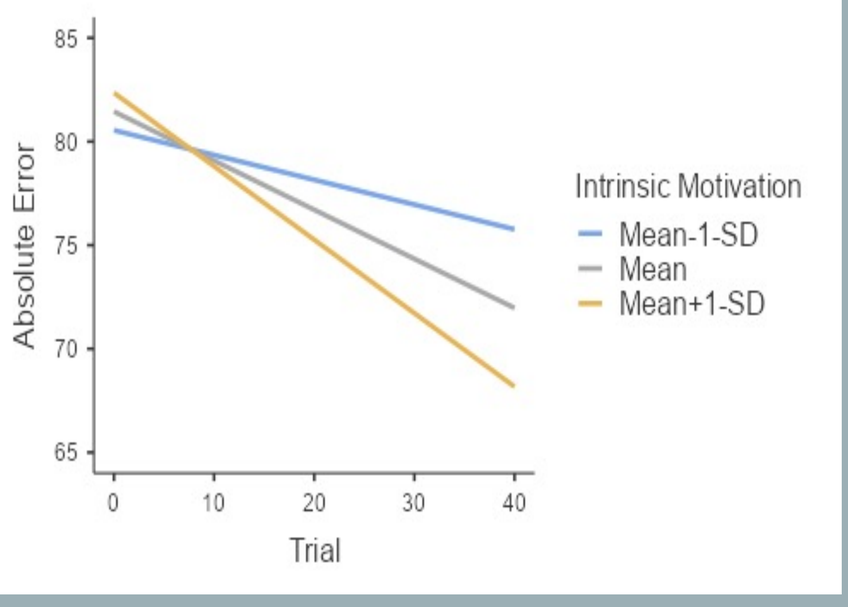
RESULTS: N=58

(Hierarchal Linear Modelling)









NAME	ESTIMATE	*t*(58)
Intercept	81.45	47.34***
Trial	-0.24	-4.031***
Intrinsic Motivation	0.91	0.51
Extrinsic Motivation	-0.3	-0.7
Agreeableness	3.91	2.51*
Conscientiousness	2.5	1.74
Extraversion	1.72	1.15
Emotional Stability	1.24	0.94
Openness	1.86	0.94
Alexithymia	-0.11	-0.48
Intrinsic Motivation*Trial	-0.12	-2.1*
Extrinsic Motivation*Trial	-0.01	-2.72**
Agreeableness*Trial	-0.03	-.51
Conscientiousness*Trial	0.04	0.89
Extraversion*Trial	-0.1	-2.33*
Emotional Stability*Trial	-.01	-1.8
Openness*Trial	-0.1	-2.7**
Alexithymia*Trial	-0.001	-0.35

DISCUSSION:

- *External incentives lead to greater responsiveness to feedback.*
- *Emotional Stability (Neuroticism) is related to greater responsiveness to feedback. (Attentional Control Theory {Eysenck et al, 2007} Neuroticism impairs cognitive functioning.)*
- *Intrinsic Motivation is associated with greater responsiveness to feedback.*

Future Analysis:

- The data described here is not complete, when group membership is equal, and the data can be split into groups (as well as when the executive function measures are included) we are interested to see if these metrics can predict responsiveness to feedback.
- Much work on the clinical work on bio/neurofeedback is done on conditions characterized by emotional instability, whilst our preliminary data suggests those interventions may not be conducive for those individuals.

Future Research? → *Bio*feedback Bio*feedback* → ***Heartbeat Detection?***

The inefficacy problem: How does this research help?
By testing the various predictors mentioned above, the study will help address the efficacy of biofeedback training programmes by predicting the success of a potential intervention based on personal characteristics.