MOTOR AND PERCEPTION - BASED PREDICTION

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Introduction

Do action-perception dissociations affect prediction? We performed an experiment to evaluate whether prediction is differently realized when it's aimed at driving a motor act and when instead its purpose is "perceptual-only". In particular we focused on how dynamical information of target motion is used depending on prediction goal. We compared therefore the results of a previous motor experiment (an interception task) with a predictive task in which no motion was involved.

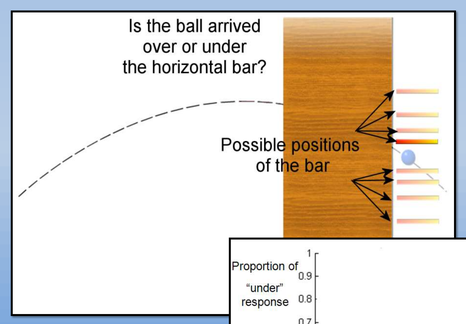
Devices

(1) ViSaGe stimulus generator - Cambridge Research Systems

(2) Monitor - BARCO Calibrator system

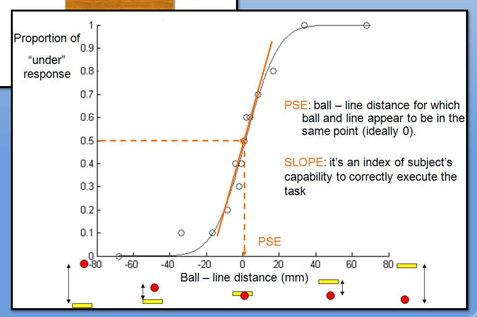
(3) CB6 Response Box - Cambridge Research Systems

Protocol and Analysis

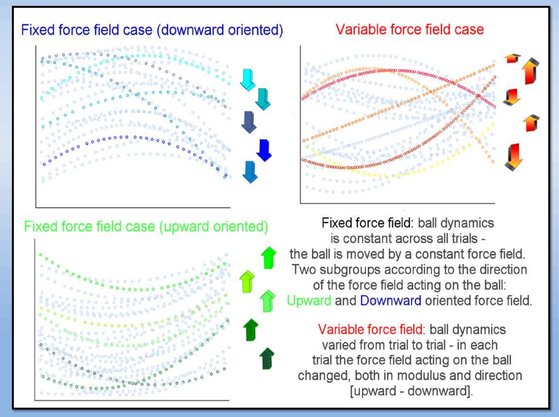


37 subjects

Psychometric function

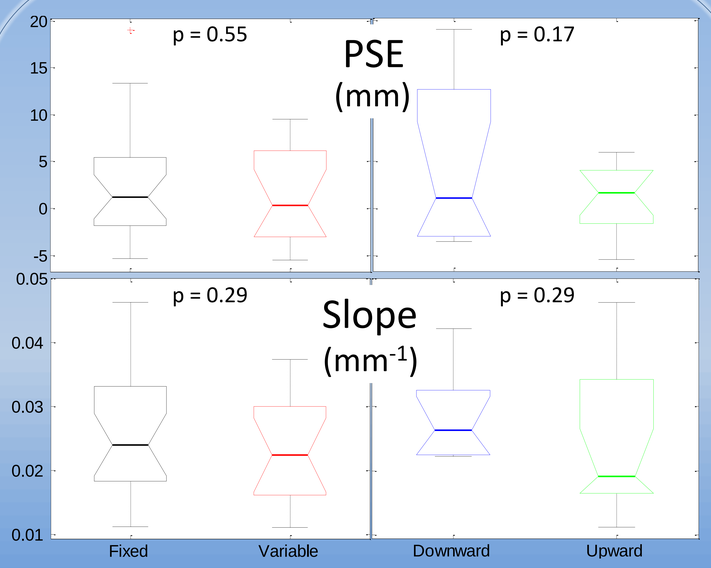


Experimental design



Examples of ball trajectories and representation of the force fields applied to the ball in the three experimental conditions.

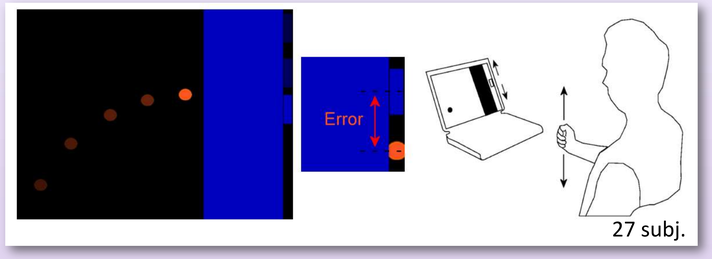
Results



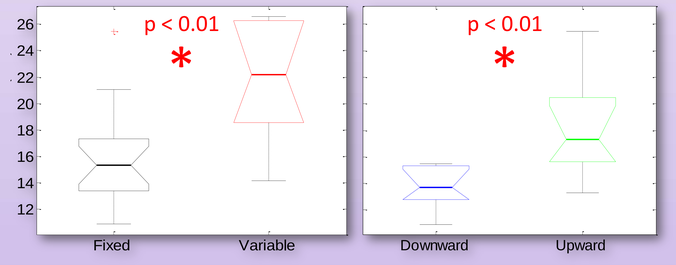
Fixed dynamics is not easier to be predicted than **variable** dynamics

Gravitational and **anti-gravitational** like behaviors are equally easy in prediction

MOTOR PREDICTION



Absolute mean error (mm)



Fixed dynamics improves prediction in interception

Gravitational like behavior is easier to intercept.

Conclusions

Prediction is performed differently when its purpose is a motor act versus a perceptual one. In a motor task humans understand when there is a unifying characteristic among different trials and model this constant parameter to better realize interception. In a perceptual task instead information coming form previous experience doesn't play a significant role in prediction.

REFERENCES

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ACKNOWLEDGMENTS

The work presented in this poster has been supported by the ROBOTCUB project (IST-2004-004370), funded by the European Commission through the Unit E5 ''Cognitive System''.

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