BOOK OF ABSTRACTS

SEVENTEENTH INTERNATIONAL CONFERENCE ON PERCEPTION AND ACTION

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ICPA XVII
perception action 2013

ESTORIL • PORTUGAL

TÍTULO **XVIIth INTERNATIONAL CONFERENCE ON PERCEPTION AND ACTION**

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Lisboa | PORTUGAL

DATA **Julho de 2013**

ISBN **978-972-735-193-0**

POSTER

THE CONTRIBUTION OF SENSORY INFORMATION ON THE UNINTENTIONAL SYNCHRONIZATION OF SIDE-BY-SIDE WALKERS

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Introduction

When people walk side by side, lower limb kinematics often become unintentionally synchronized. This interpersonal coordination can be modelled by weakly coupled oscillators (i.e., dynamical systems). The coupling strength is partly determined by perceptual information, wherein visual seems to dominate over auditory input (Demos, Chaffin, Begosh, Daniels, & Marsh, 2012). No differences were found between auditory and visual input when synchronizing during walking. Yet, most studies focused on few parameters, gathered walking samples on treadmill, and manipulated sensory input insufficiently (Nessler & Gilliland, 2009). Considering findings of intentional synchronization (Repp, 2004), auditory and visual input should affect gait parameters asymmetrically. The scope of our study is to understand the effect of sensory information provided by the partner's gait on unintentional synchronization of side-by-side walkers.

Methods

Ten naive participants walked 9 meters by an experimenter's side with preferred velocity and cadence. The participants could hear (i.e., auditory condition), see (i.e., visual condition), hear and see (i.e., bimodal condition) the experimenter walking, or walked alone (i.e., baseline condition). Entrainment (i.e., frequency, phase, and amplitude locking) was assessed and analysed as a time series.

Results

We expected that seeing leads to more entrainment than hearing. Most importantly, we expected that seeing affects spatial parameters (i.e., stride length) and temporal parameters (i.e., cycle time) while hearing has additional effects on temporal parameters.

Conclusions

Besides illustrating the contribution of unimodal input and benefits of multimodal integration for strengthening coupling between oscillators, our findings could have implications for the development of rehabilitation methods that use sensory synchronization for improving gait dynamics.

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Acknowledgments. This research was supported by FEDER grants through the Operational Competitiveness Program - COMPETE and by national grants through FCT - Foundation for Science and Technology, with the Project: FCOMP-01-0124-FEDER-022674 and individual fellowships (SFRH/BD/88396/2012; SFRH/BPD/63393/2009).