



The 19th Annual International Multisensory Research Forum

Welcome to IMRF 2018



We would like to personally welcome each of you to Toronto, Canada for the 19th Annual International Multisensory Research Forum! Multisensory research continues to be an exciting and dynamic field. We hope you will enjoy this program of exciting scientific lectures and symposia, poster presentations, and networking forums that will benefit your research and, we hope, generate new collaborations!

Sincerely,

IMRF 2018 Organizing Committee



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For symposia, talk and poster abstracts, see the IMRF 2018 webpage <u>imrf.info</u>

General Information

Registration

The Registration Desk will be located at the Chestnut Foyer (see "Maps" section) and open at the following times:

- Thursday, 15th from 04:30 PM 07:00 PM
- Friday 16th from 08:30 AM 03:15 PM
- Saturday 17th from 08:30 AM 03:15 PM



Venue

The Chestnut Conference Center (see "Maps" section) is the venue for IMRF 2018. Located adjacent to the Yonge and Dundas Square and directly north of the city's Financial District and City Hall, Chestnut Conference Centre is in the heart of the downtown core. We are only a 5-min walk from the St. Patrick subway station, a 10-min walk from Eaton Centre, and a 10-min walk from Toronto's Financial District.



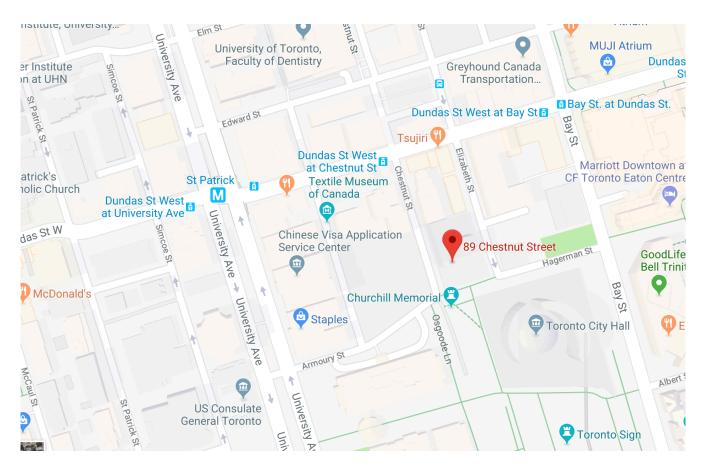
Maps

Locations

Conference:

Chestnut Conference Center,

89 Chestnut St., Toronto, ON M5G 1R3



TTC Subway Station: St Patrick (Line 1)

Dundas Streetcar Stop: Dundas St West @ Chestnut Street

Banquet Dinner:

Toronto Reference Library,

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789 Yonge St, Toronto, ON M4W 2G8

Direction to the Toronto Reference Library:

Chestnut to Dundas Square (by foot) Line 1 (Northbound) towards Finch Station Exit at Bloor and Yonge St

Interactive Map

Other locations / recommended spots (attractions, bars, etc.) at downtown Toronto can be found on the <u>Handy map</u> (see IMRF 2018 webpage).



IMRF 2018 Sponsors









Vison: Science to Applications (VISTA)









Committees

Scientific Committee:

(Vanderbilt University, USA)
(University of Birmingham, UK)
(Trinity College Dublin, Ireland)
(Baylor College of Medicine, USA)
(Northwestern University, USA)
(Western University, Canada)
(University of Oxford, UK)
(UCLA, US)

Local Committee:

Michael Barnett-Cowan	(University of Waterloo)
Jennifer Campos	(Toronto Rehabilitation Institute)
Ryan Stevenson	(Western University)
Vanessa Harrar	(Université de Montréal)

Conference Organizing Committee:

Luc Tremblay	(University of Toronto)
Laurence Harris	(York University)
Nils Bury	(York University)
Sarah D'Amour	(York University)
Lindsey Fraser	(York University)
Rachel Goodman	(University of Toronto)
Jongjin Kim	(York University)
Gerome Manson	(University of Toronto)
Damian Manzone	(University of Toronto)
Meaghan McManus	(York University)
Stefania Moro	(York University)

Keynote Speaker – Charles Spence

Multisensory Flavour Perception: Insights for/from the Spatial Senses

Prof Charles Spence

Head of the Crossmodal Research Laboratory, Oxford University

Food is both fundamental to our survival and fun to study. Furthermore, there is nothing that gets your brain going quite like the sight/smell of one's favourite food when hungry.[1] And, as the eminent British biologist J. Z. Young once noted, it is perhaps no coincidence that the mouth and the brain lie so close together in most species.[2] No wonder then that the brain rapidly estimates the energy-density of potential food sources in the environment and devotes our limited attentional resources accordingly.[3] At the same time, however, it is much harder, practically-speaking, to study flavour (i.e., the chemical senses) than it is to study the spatial senses of vision, hearing, and touch. This means that insights/theoretical frameworks into multisensory flavour perception may come more easily from studying the spatial senses (think sensory dominance and Bayesian causal inference, or the notion of super- and sub-additive interactions) than from studying flavour perception directly.

One might also question whether any unique insights about multisensory perception have emerged from the study of the chemical senses. In this talk, I will suggest that the phenomenon of 'oral referral' has no equivalent in the spatial senses,[4] and that gustatory-olfactory integration does exhibit some special properties (such as when smells become 'sweet').[5] There are also challenging philosophical questions here around the very definition of flavour itself, and which senses are constitutive versus 'merely' modulatory of this most multisensory of our everyday experiences.[6] Ultimately, I want to argue that our understanding of multisensory perception, both in the case of the integration of the chemical senses, and when it comes to the spatial senses, will likely benefit through the incorporation of the study of flavour perception into the broader scope of multisensory research.

^[1] Wang, G.-J., Volkow, N. D., Telang, F., Jayne, M., Ma, J., Rao, M., Zhu, W., Wong, C. T., Pappas, N. R., Geliebter, A., et al. (2004). Exposure to appetitive food stimuli markedly activates the human brain. NeuroImage, 212, 1790-1797.

^[2] Young, J. Z. (1968). Influence of the mouth on the evolution of the brain. In P. Person (Ed.), Biology of the mouth: A symposium presented at the Washington meeting of the American Association for the Advancement of Science, 29-30 December 1966 (pp. 21-35). Washington, DC: American Association for the Advancement of Science.

^[3] Sawada, R., Sato, W., Toichi, M., & Fushiki, T. (2017). Fat content modulates rapid detection of food: A visual search study using fast food and Japanese diet. Frontiers in Psychology, 8:1033.

^[4] Spence, C. (2016). Oral referral: On the mislocalization of odours to the mouth. Food Quality & Preference, 50, 117-128.[5] Auvray, M., & Spence, C. (2008). The multisensory perception of flavor. Consciousness and Cognition, 17, 1016-1031.

^[6] Spence, C., Smith, B., & Auvray, M. (2015). Confusing tastes and flavours. In D. Stokes, M. Matthen, & S. Biggs (Eds.), Perception and its modalities (pp. 247-274). Oxford, UK: Oxford University Press.

Keynote Speaker – Charles Spence

About the Speaker: Professor Charles Spence is the head of the Crossmodal Research Laboratory in the Psychology Department of Oxford University. He is interested in our brains process information from our different senses to form the extraordinarily rich multisensory experiences that fill our daily lives. His research focuses on how a better understanding of the



human mind will lead to the better design of multisensory foods, products, interfaces, and environments in the future and has major implications for the design everything from household products to mobile phones, and from the food we eat to the places in which we work and live. Charles has advised multinational companies on aspects of multisensory design, packaging, and branding, and has conducted research on humancomputer interaction issues on the European Space Shuttle. He is currently working on problems associated with the design of foods that maximally stimulate the senses. He has been awarded the 10th Experimental Psychology Society Prize, the British Psychology Society: Cognitive Section Award, the Paul Bertelson Award, and the Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation in Germany, not to mention the 2008 IG Nobel prize for nutrition, for his groundbreaking work on the 'sonic *crisp'!* He is the author of "Gastrophysics: the new science of eating", "The Perfect Meal: the Multisensory Science of Food and Dining" (with Betina Piqueras-Fiszman), "In touch with the Future: the sense of touch from cognitive neuroscience to virtual reality" (with Alberto Gallace) and "The Multisensory Driver: implications for ergonomic car interface design" (with Cristy Ho).

Keynote Speaker – Ladan Shams

Crossmodal interactions in perception, memory and learning: on the scene and behind the scene

Ladan Sharms, PhD UCLA Psychology Department

What are the principles that govern crossmodal interactions? Comparing human observers' multisensory perception with that of a Bayesian observer, we have found that humans' multisensory perception is consistent with Bayesian inference both in determining when to combine the crossmodal information and how to combine them. The former problem is a type of causal inference. Causal inference, which has been largely studied in the context of cognitive reasoning, is in fact a critical problem in perception. Our Bayesian causal inference model accounts for a wide range of phenomena including a wide range of multisensory illusions, as well as counter-intuitive phenomena such as partial integration and negative gain. In accounting for both perception of objects in the environment as well as perception of one's own body, our findings suggest that the same computational principles govern perception of the world and self.

Crossmodal interactions also play an important role in various types of learning and memory. We have found that multisensory experience enhances and accelerates perceptual learning, it instantaneously recalibrates unisensory unisensorv representations, and improves unisensory episodic memory. These findings show that crossmodal interactions not only affect perception when signals from multiple modalities are present, but also influence the subsequent unisensory processing. In fact our recent findings show that in some cases, crossmodal interactions can aid learning even in the absence of multisensory experience: training in auditory modality produced substantial visual learning where training visual training failed to produce any significant learning. In other words, outsourcing the training to a different modality was key to learning. I will discuss the variety of ways in which crossmodal interactions can benefit learning and memory. Altogether, these findings suggest that crossmodal interactions influence both multisensory and unisensory perception, memory and learning in a robust and rapid fashion.

Keynote Speaker – Ladan Shams

About the Speaker: Ladan Shams is a professor of Psychology, BioEngineering, and Neuroscience at UCLA, and the director of the Multisensory Perception Laboratory at UCLA. Dr. Shams received her Ph.D. in Computer Science at USC and her postdoctoral training in Cognitive Neuroscience at Caltech. Dr. Shams' research interests focus on multisensory perception and learning in humans. Dr. Shams has served as Associate Editor of Frontiers in Integrative Neuroscience, and Frontiers



in Human Neuroscience, as an Action Editor of Psychonomic Bulletin & Review, and is on the editorial board of Multisensory Research. Dr. Shams is a member of the National Science Foundation College of Reviewers, the Society for Neuroscience, the Vision Sciences Society, and the International Multisensory Research Forum. She was featured by Chronicle of Higher Education as one of "five scholars to watch" and is frequently consulted as an expert by media outlets such as NPR, BBC and CNN.

Schedule – Thursday 14

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5:15 PM	Welcome Reception	4:30 pm - 6:30 pm
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Schedule – Friday 15

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9:30 AM	Recovering from Blindness: Learning to see using multisensory information
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10:30 AM	Coffee Break 10:30 am - 10:45 am
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11:00 AM	Audio-Visual Integration
11:15 AM	10:45 am - 12:00 pm
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12:30 PM	Lunch
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Schedule – Saturday 16

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10:15 AM			
10:30 AM	Coffee Break 10:30	0 pm - 10:45 pm	
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11:15 AM	Multisensory Integration & Aging		
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Schedule – Sunday 17

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9:15 AM	Where is my hand? On the flexibility of multi	sensory spatial calibration to encode hand
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Scientific Program – Symposia

Friday, 15th, 09:00 – 10:30 AM

Recovering from Blindness: Learning to see using multisensory information Organizer: Marc Ernst

Talk 1: Learning to See Late in Childhood Pawan Sinha

Talk 2: How experience shapes brain specializations in the absence of vision *Amir Amedi*

Talk 3: Motion processing after sight restoration: No competition between visual recovery and auditory compensation

Davide Bottari*, R. Kekunnaya, M. Hense, N. F. Troje, S. Sourav, B. Roder

Talk 4: A brief period of early visual deprivation alters cross-modal interactions *Batsheva Hadad*

Talk 5: Impairment of automatic "vision for action" functions in the newly sighted, following prolonged visual deprivation Ayelet McKyton*, Ehud Zohary

Talk 6: Multisensory perception for action in newly sighted individuals Irene Senna, Sophia Pfister, Marc Ernst*

Friday, 15th, 01:30 – 02:15 PM

Progresses in Vestibular Cognition Organizer: Elisa Raffaella Ferre

Talk 1: Vestibular-Somatosensory Interactions Affect The Perceived Timing Of Tactile Stimuli

Laurence R. Harris* and Stefania S. Moro

Talk 2: Vestibular and Somatic Signals for Verticality *Elisa R. Ferre**

Talk 3: Reciprocal interactions between own-body cognition and vestibular information processing

Christophe Lopez*

Friday, 15th, 02:15 – 03:15 PM

Relationship of Crossmodal Correspondences to Language

Organizer: Krish Sathian

Talk 1: Introduction

Charles Spence

Talk 2: Language and Odor Color CorrespondencesLaura Speed and Asifa Majid

Talk 3: Mechanisms of Sound SymbolismDavid M. Sidhu and Penny M. Pexman

Talk 4: Neural Basis of Sound Symbolic Crossmodal Correspondences *Krish Sathian, Lynne Nygaard, Simon Lacey, Kelly McCormick, Sara List and Randall Stilla*

Friday, 15th, 04:45 – 06:00 PM

The Role of Experience in the Development of Multimodal Integration Organizer: Daphne Maurer

Talk 1: Early Experience Shapes the Development of Selective Attention and Multisensory Processing in Human Infants David Lewkowicz

Talk 2: The Development of Audiovisual Integration: New Insights from Adults treated for Congenital Cataract

Daphne Maurer, Yi-Chuan Chen, David Shore, & Terri L. Lewis

Talk 3: Cross-Modal Plasticity in Deafness: Evidence from Children and Adults Fitted with Cochlear Implants

Anu Sharma

Talk 4: Short Periods of Perinatal Sensory Experience Change the Structure and Function of Auditory Cortex

Stephen G. Lomber and M. Alex Meredith

Talk 5: Enhanced cross-modal auditory response in primary visual cortex with altered critical period timing

Takao Hensch

Saturday, 16th, 09:00 – 10:30 PM

Multisensory Integration and the Body

Organizer: Jared Medina

Talk 1: Feeling a touch to the hand on the foot Stephanie Badde1,2*, Brigitte Roder2, & Tobias Heed2,3

Talk 2: Canonical computations mediate cue combination in touch *Jeffrey M. Yau* & Md. Shoaibur Rahman*

Talk 3: Moving with a growing body: development of visual-proprioceptive integration for hand motor control

Marie Martel* & Tobias Heed

Talk 4: Influence of stored body representations on multisensory integration Jared Medina*, Yuqi Liu

Talk 5: Body size perception in healthy adults can be manipulated using galvanic vestibular stimulation and distorted visual exposure *Sarah D'Amour*, Deborah Alexe, Isabella Lim and Laurence R. Harris*

Talk 6: Two flavors of tool embodimentLuke E. Miller

Saturday, 16th, 10:45 – 12:00 PM

Multisensory Integration & Aging Organizer: Jeannette R. Mahoney

Talk 1: Temporal Integration of Multisensory Events in Later Years

*Michael Barnett-Cowan, PhD

Talk 2: Simultaneity and temporal order judgments are coded differently and change with age: an event-related potential study

*Aysha Basharat, Meaghan S. Adams, W. Richard Staines, Michael Barnett-Cowan

Talk 3: A population study of multisensory perception in middle-aged and older adults: The Sound-Induced Flash Illusion in The Irish Longitudinal Study on Ageing (TILDA) *Annalisa Setti, Belinda Hernandez, Rose Anne Kenny, Fiona N. Newell

Talk 4: Intra- and inter-individual differences in susceptibility to the Sound-Induced Flash illusion

*Jason Chan & Annalisa Setti

Talk 5: Understanding Differential Visual-Somatosensory Integration Effects in Aging *Jeannette R. Mahoney, PhD

Sunday, 17th, 09:00 – 10:15 PM

Where is my hand? On the flexibility of multisensory spatial calibration to encode hand positions and movements.

Organizer: Denise Henriques

Talk 1: Motor cortex effects of recalibrating visuo-proprioceptive estimates of hand position

Hannah J. Block*, Felipe Munoz-Rubke, Jasmine L. Mirdamadi

Talk 2: Retention of implicit sensorimotor spatial recalibration

Erin K. Cressman, Stefan Maksimovic, Kristin-Marie Neville, Jean-Michel Bouchard

Talk 3: Where's my hand? Afferent and efferent signals of hand position in visuomotor adapation.

Denise Henriques, Jennifer Ruttle, Shanaathanan Modchalingam, Chad Vachon and Marius 't Hart

Talk 4: Models of visuo-vestibulo-proprioceptive integration for sensorimotor coordination

Joseph McIntyre & Michele Tagliabue

Talk 5: Proprioceptive feedback utilization during visually-guided movements: Impulse vs. limb-target regulation processes

Luc Tremblay, Rachel Goodman, Stephen Bested, Gerome Manson, John de Grosbois

Sunday, 17th, 10:30 – 11:45 PM

The Multisensory Space - Perception, Neural representation and Navigation" Organizer: Daniel Chebat & Shachar Maidenbaum

Talk 1: The modality independent nature of the human brain's spatial network *Chebat D.*

Talk 2: Structural, metabolic and functional changes in the congenitally blind brain *Ron Kupers and Maurice Ptito*

Talk 3: Space without sightCollignon O

Talk 4: Spatial perception and interaction with manipulated sensory reliabilityMaidenbaum S

Talk 5: Task Selectivity as a comprehensive principle for brain organization - including in early sensory region

Heimler B, Hofstetter S, Maidenbaum S, Amedi A

Scientific Program – Talks

Friday, 15th, 10:45 – 12:00 AM

Audio-Visual Integration

T1.1 A common mechanism processes auditory and visual motion *David Alais*

T1.2 Effects of horizontal and vertical discrepancy of visual-auditory stimuli on reaction time: Multisensory integration or exogenous spatial attention? A TWIN analysis *Hans Colonius*

T1.3 Generalizing audio-visual integration: what kinds of stimuli have we been using? *Michael Schutz*

T1.4 Concurrent Unimodal Learning Enhances Multisensory Responses of Symmetric Crossmodal Learning in Robotic Audio-Visual Tracking Danish Shaikh

T1.5 Differential effects of the temporal and spatial distribution of audiovisual stimuli on cross-modal spatial recalibration

Patrick Bruns

Saturday, 16th, 01:30 – 03:15 PM

Audio-Visual substitutions and illusions

T2.1 Training-induced plasticity with a visual-to-auditory conversion system. Seeing the thunder while still hearing it.

Malika Auvray

T2.2 Face and line-orientation discrimination via sensory substitution and their brain dynamics in the congenitally blind

Micah Murray

T2.3 Noise, multisensory integration, and previous response in perceptual disambiguation

Cesare Parise

T2.4 Temporal context effects in the McGurk illusion

Lars T Boenke

T2.5 A new psychophysical paradigm to quantitatively assess body ownership in the rubber hand illusion paradigm.

Marie Chancel

T2.6 Spatial multisensory recalibration operates over distinct timescales

David Watson

T2.7 Retiring the McGurk Effect

Lawrence Rosenblum

Saturday, 16th, 01:30 – 03:15 PM

Developmental Perspectives

T3.1 Quantifying the weights of multisensory influences on postural control across development

Mark A. Schmuckler

T3.2 Infant learning in vision and beyond

Chia-huei Tsena

T3.3 Crossmodal association of auditory and visual material properties in infants Yuta Ujiie

T3.4 Visual and somatosensory hand representation through development.

Lucilla Cardinali

T3.5 The role of allocentric information in the development of spatial navigation across childhood

Luigi F. Cuturi

T3.6 Sensory dominance and multisensory integration as screening tools in aging Pawel J. Matusz

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Music

T4.1 Rapid improvement of audiovisual simultaneity perception after short-term music training

Karin Petrini

T4.2 The Multisensory Perception of Music

Frank Russo

T4.3 Tracking the evolution of learning a dance choreography in expert ballet dancers and people with Parkinson's disease

Joseph DeSouza

T4.4 Improving visual recognition memory with sound Arit Glicksohn

T4.5 Horizontal variation in visual stimuli affects auditory pitch perception equally in musicians and non-musicians

Jonathan Wilbiks

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Haptics and Body Schema

T5.1 Electrophysiological Evidence for the Effect of Tool Use on Visuo-Tactile Integration in Near and Far space

Elena Gherri

T5.2 Influences of Conflicting Visual Information on Body Schema and Haptic Perception of Hands

Katsunori Okajima

T5.3 The interplay of visual and haptic cues in multisensory grasping

Robert Volcic

T5.4 A meaningful pairing between action and the senses

Georgiana Juravle

Scientific Program – Poster Session

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- **1.1** The prevalence of between-hands spatial codes in a tactile Simon task *Gherri, E., & Theodoropoulos, N.*
- **1.2** Neural underpinnings of audio-visual integration in the Pip and Pop effect *Fleming, J.T., Noyce, A.L. & Shinn-Cunningham, B.G.*
- **1.3** Gender difference of a stroking person influences rubber hand illusion according to autistic traits

Tsuboi, K., Fukui, T.

- **1.4** The role of semantic congruency and awareness in spatial ventriloquism *Delong, P. & Noppeney, U.*
- **1.5** A Pair of Ambiguous Visual Stimuli Improves Auditory Spatial Discrimination *Cappelloni, M.S., Shivkumar, S., Haefner, R.M. & Maddox, R.K.*
- **1.6** The Dynamic Double Flash Illusion: Auditory Triggered Replay of Illusory Visual Expansion *Stiles, N R.B., Tanguay Jr., A .R. & Shimojo, S.*
- **1.7** Brightness-mass matchings in adults' reasoning of physical events *Sanal, N., Bremner, J.G. & Walker, P.*
- **1.8** The rubber hand illusion in merged vision with another person *Okumura, K., Ora, H. & Miyake Y.*
- **1.9 Developmental susceptibility to visuospatial illusions across vision and haptics** *Holmes, C.A., Cooney, S.M., & Newell, F.N.*
- **1.10** Stimulus Parameters Underlying Sound Symbolic Crossmodal Correspondences *List, S.M., McCormick, K., Lacey, S., Sathian, K. & Nygaard, L.C.*
- **1.11** Electrophysiological evidence for differences between fusion and combination illusions in audiovisual speech perception *Lindborg, A., Baart, M. & Andersen, T. S.*
- **1.12** Auditory feedback effects on spatial learning: shape recognition after audio-motor training *Martolini, C., Cappagli, G., Campus, C. & Gori, M.*
- **1.13** Human echolocators achieve perceptual constancy by discounting variations in click spectrum *Norman, L. J. & Thaler, L.*
- **1.14** Occipital early responses to sound localization in expert blind echolocators *Tonelli A., Campus C., & Gori M.*
- 1.15 Rapid, flexible cue combination with augmented and familiar sensory signals

Negen, J., Wen, L., Probert, H., Thaler, L. & Nardini, M.

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1.16 Multimodal feedback for spatial learning: comparing the effects on sighted and visually impaired individuals.

Cappagli G., Cuppone A.V., & Gori M.

- **1.17** The early auditory-evoked cortical response predicts auditory speech-in-noise identification and lipreading ability in normal-hearing adults *Dias, J.W., McClaskey, C.M. & Harris, K.C.*
- **1.18** Temporal tuning of immediate and repeated exposure to audio-visual spatial discrepancies *Goodliffe, J.P., Roach, N.W. & Webb, B.S.*
- 1.19 Audiovisual crossmodal correspondences between bubbles' size and pouring sounds' pitch in carbonated beverages

Roque, J.R., Lafraire, J.L., & Auvray, M.A.

- **1.20** Face Viewing Behavior Predicts Multisensory Gain During Speech Perception *Rennig, J., Wegner-Clemens, K. & Beauchamp, M.S.*
- **1.21** Audiovisual recalibration and selective adaptation for vowels and speaker sex *Burgering, M. A., Baart, M. & Vroomen, J.*
- **1.22** Crossmodal correspondences between pitch, retinal size, and real-world size *Janini, D. & Konkle, T.*
- **1.23** Adapting emotions across the senses: the benefit of congruent over incongruent audiovisual emotional information depends on the visibility of emotional faces *Izen, S.C., Morina, E., Leviyah, X., & Ciaramitaro, V.M.*
- **1.24** Naturalistic Stimuli Reveal Selectivity for Eye and Mouth Movements within the Human STS *Zhu, L.L. & Beauchamp, M.S.*
- **1.25** Performing a task jointly modulates audiovisual integration in timing and motion judgements *Wahn, B., Dosso, J., Tomaszewski, M. & Kingstone, A.*
- **1.26** Audiovisual integration of spatial stimuli is affected by performing a task jointly *Wahn, B., Keshava, A., Sinnett, S., Kingstone, A. & König, P.*
- **1.27** The Effect of Multisensory Temporal Congruency on Pleasure *Yeh, M.S. & Shams, L.*
- **1.28** Role of auditory and visual acuities in temporal binding window measurement Unnisa Begum, V. & Barnett-Cowan, M.
- **1.29** Robust temporal averaging of time intervals between action and sensation *Chen, L.*
- **1.30** Crossmodal associations modulate multisensory integration: modifying causal priors of simple auditory and visual stimuli

Tong, J., Bruns, P., Kanellou, A. & Roeder, B.

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1.31 Different processing of rapid recalibration to audio-visual asynchrony between spatial frequencies

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1.32 Audio-visual associations show differential effects on auditory and visual responses in the mouse OFC

Sharma, S. & Bandyopadhyay, S.

1.33 Deficient prepulse inhibition of the startle reflex in schizophrenia using a cross-modal paradigm

Haß, K.H., Bak, N., Szycik, G.R., Glenthoj, B.Y. & Oranje, B.

- **1.34** Impaired sensory-motor learning in newly sighted children *Pfister, S., Senna, I., Wiebusch, D. & Ernst, M. O.*
- 1.35 Perceptual Training of Multisensory Integration in Children with Autism Spectrum Disorder: A Single-Case Training Study

Dunham, K., Feldman, J.I., Conrad, J.G., Simon, D.M., Tu, A., Broderick, N., Wallace, M.T., & Woynaroski, T.

- **1.36** The Principles of Multisensory Integration in the Rehabilitation of Hemianopia Dakos, A. S., Jiang, H., Rowland, B. A. & Stein, B. E.
- **1.37** Sub-clinical levels of autistic traits impair multisensory integration of audiovisual speech van Laarhoven, T., Stekelenburg, J.J. & Vroomen, J.
- **1.38** Modified Medial Geniculate Projections to Auditory and Visual Cortex Following Early-Onset Deafness

Trachtenberg, B., Butler, B.E. & Lomber, S.G.

- **1.39** Perceived Simultaneity and Temporal Order of Audiovisual Events Following Concussion *Wise, A. & Barnett-Cowan, M.*
- **1.40** Group differences in audiovisual multisensory integration in individuals with and without autism spectrum disorder: A systematic review and meta-analysis *Feldman, J.I., Dunham, K., Samuel, A., Cassidy, M., Liu, Y. & Woynaroski, T.G.*
- 1.41 The Relationship Between Tactilely and Visually Driven Activation of Early Visual Cortex in the Visually Impaired

Stiles, N.R.B., Choupan, J., Jung, E., Purington, C., Wang, J., Law, M., Kashani, A.H., Ameri, H., Aguirre, G K., Weiland, J.D., Patel, V.R. & Shi, Y.

- **1.42** Alpha oscillations as an index of lip-reading ability *Ganesh, A.C., Dimitrijevic, A. & Shahin, A.*
- **1.43** Audiovisual Integration of Consonant Clusters Andersen, T.S. & Gil-Carvajal, J-C.

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1.44 Vision dominates audition in adults but not children: Adults have a lower threshold for the McGurk effect in audio-visual noise Hirst, R.J., Stacey, J., Cragg, L., Stacey, P.C. & Allen, H.A. 1.45 Integration of smell and taste: EEG study of brain mechanisms allowing the enhancement of saltiness with aroma Sinding, C., Thibault, H. & Thomas-Danguin T. 1.46 Shapes associated with emotion can influence product taste expectations Orejarena, M.C., Salgado-Montejo, A., Salgado, R.. Betancur, M.I., Velasco, C., Salgado, C.J. & Spence, C. 1.47 **Do Gustatory Global-Local Processing Styles Prime Vision?** Karademas, C. & List, A. 1.48 Psychological effects induced multimodally by the aroma and the color of bottles Okuda, S. **1.49** Heart rate and skin conductance responses during assimilation and contrast of different juice samples Verastegui-Tena, L.M., van Trijp, H. & Piqueras-Fiszman, B. 1.50 The homunculus: grounding cognition Forster, B. & Calvo-Merino, B. More than skin-deep: Integration of skin-based and musculo-skeletal reference frames in 1.51 localisation of touch Sadibolova, R., Tamè, L. & Longo, M.R. Vision enhances touch just before grasping an object 1.52 Juravle, G., Colino, F., Meleqi, X., Binsted, G. & Farnè, A. Pompoms and white blocks should be light: Evidence of how we act upon weight expectations 1.53 Wilson, H., Walker, P. & Bremner, G. Audiovisual Interactions in Primary Auditory Cortex of the Mongolian Gerbil (Meriones 1.54 unguiculatus) Probed with Amplitude-Modulated Stimuli Bremen, P. 1.55 Endogenous attention enhances neuronal signature of audio-visual sound-shape correspondence Chow, H.M. & Ciaramitaro, V.C. 1.56 Multisensory Responses in the Primary Auditory Cortex of the Cat Boucher, C., Butler, B. & Lomber, S. G. 1.57 Hand distance modulates the electrophysiological correlates of target selection during a tactile search task Ambron, E.A., Mas-Casadesús, A.M.C. & Gherri, E.G.

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1.58 Networks supporting auditory-visual speech: evidence from invasive neural recordings in humans

Ahn E., Plass J., Rakochi A., Stacey W. & Brang D.

- **1.59** Event-related brain potentials (ERPs) during peripheral and central visual field stimulation in the context of self-motion perception (vection) *Keshavarz, B., Haycock, B., Adler, J. & Berti, S.*
- 1.60 Disentangling processing speed-up versus true multisensory integration using Support Vector Machine method

Mercier M.R. & Cappe, C.

1.61 Visual Activation and Lateralized Area Prostriata Induced During a Perceived Trance Process by an Expert

DeSouza, J.F.X. & Rogerson, R.

1.62 Parkinson's Disease and Oscillatory Brain Rhythms: Putative EEG changes in Parkinson's patients performing the sound induced double-flash illusion task before and after neurorehabilitation.

Cohan, R. & DeSouza, J.F.X.

- **1.63** Short- and long-term evaluation of the effects of dance on people with Parkinson's Disease. *Bearss, K. & DeSouza, J.F.X*
- **1.64** A vestibular-gravitational contribution to perceived body weight *Ferrè, E.R., Frett, T., Haggard, P. & Longo, M.R.*
- **1.65 Perceived timing of active head movements reduced with increased speed** *Sachgau, C., Chung, W. & Barnett-Cowan, M.*
- **1.66** Is linear vection enhanced when perceived upright is orthogonal to gravitational upright? *McManus, M. & Harris, L.R.*
- **1.67** When in conflict, choose touch! A visuo-haptic, virtual reality investigation of conflicting shape information in object processing *Kang, H.M.*
- **1.68** Vestibular signals modulate perceptual alternations in binocular rivalry from motion conflict *Keys, R.T., Paffen, C., MacDougall, H., Alais, D. & Verstraten, F.A.J.*
- **1.69** Illusions of self-motion perception in the visual and vestibular systems during cue conflict *Kirollos, R. & Herdman, C. M.*
- **1.70** Feeling the beat: An exploration into the neural correlates of somatosensory beat perception *Gilmore, S. & Russo, F.*
- **1.71** The Development of Auditory–tactile Integration Stanley, B., Chen, Y.C., Lewis, T.L., Maurer, D., & Shore, D.I.
- **1.72** Decoding the sound of hand-object interactions in early somatosensory cortex *Bailey, K. M., Giordano, B. L., Kaas, A. & Smith, F. W.*

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- **1.73** Musical expertise weakens the cost of dividing attention between vision and audition *Ciaramitaro, V.M., Chow, H.M., & Silva, N.*
- **1.74** Spatial attention modulates multisensory selection *Jensen, A., Merz, S., Spence, C., & Frings, C.*
- **1.75** Attentional modulation of multisensory event perception in a voluntary reaching movement *Loria, T., Tanaka, K., Tremblay, L., & Watanabe, K.*
- **1.76** Self-produced walking sounds change body-representation: An investigation on individual differences and potential positive impact on physical activity *Tajadura-Jiménez, A., Zhang, L., Newbold, J., Rick, P. & Bianchi-Berthouze, N.*
- **1.77** Neural circuits for visual, auditory and multisensory decision making in rats *Chartarifsky, L., Pisupati, S. & Churchland A.K.*
- **1.78** Auditory-visual Integration during the attentional blink: an event-related potential study *Ching, A., Kim, J. & Davis, C.*
- **1.79** The role of context in models of multisensory decision-making *Liu, Y., & Otto, T.*
- **1.80** Your perceived finger orientation depends on whether you move it yourself *Fraser, L. E. & Harris, L. R.*
- 1.81 Visuo-tactile Coherency of Self-generated Action via Surrogate Robot Affects Operator's Bodily Self-location

Inoue, Y., Yamazaki, K., Saraiji, M. Y., Kato, F., & Tachi, S.

- **1.82** Changes in hand localization are influenced by proprioception and prediction *Ruttle, J., 't Hart, B.M. & Henriques, D.Y.P.*
- **1.83 Does Auditory-motor learning improve discrimination ability?** *Endo, N., Mochida, T., Ijiri, T. & Nakazawa, K.*
- **1.84** Colour-Shape Correspondences: Examining the Role of Perceptual Features and Emotional Mediation

Dreksler, N. & Spence, C.

- **1.85** Mapping the topography of sensory-selective and multiple demand regions in lateral frontal cortex with combined visual, auditory and tactile fMRI *Tobyne, S.M., Noyce, A.L., Brissenden, J.A. & Somers, D.C.*
- **1.86** Audio-tactile Crossmodal Correspondences: Listen! How does that feel? Barnett, A. M., Walker, P. & Bremner, G.
- **1.87** Fast and Slow Process Integration in Visuomotor Learning: Feedback Parameters and Aging *'t Hart B.M., Ruttle J., Chauhan U., Straube A., Eggert T &, Henriques D.Y.P.*
- **1.88 "I know that Kiki is angular": The metacognition underlying sound-shape correspondences** *Chen, Y.-C., Huang, P.-C., Woods, A. & Spence, C.*

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- **1.89** Imagery clarifies confusion in the crossed-hands deficit Lorentz, L., Unwalla, K. & Shore, D.I.
- **1.90** Implied tactile motion: Localizing dynamic stimulations on the skin *Merz, S.,Meyerhoff, H.S., Spence, C. & Frings, C.*
- **1.91** Perception as Cognition: Beyond the Perception/Cognition Distinction *Hipolito, I.*
- **1.92** Mental Rotation of Digitally-Rendered Haptic Representation *Tivadar, R.I., Rouillard, T., Chappaz, C., Knebel, J.F., Turoman, N., Anaflous, F., Roche, J. & Murray, M.M.*
- **1.93** Audio-visual multiple object tracking: integration differences with age *Harrar, V., Roudaia, E. & Faubert, J.*

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- 2.1 Virtual Reality modulates Vestibular Brain Responses Gallagher, M., Dowsett, R. & Ferrè, E.R.
- **2.2** Cybersickness in virtual reality partially explained by temporal binding window width *Sadiq, O. & Barnett-Cowan, M.*
- **2.3** Sensitivity to visual gain modulation in head-mounted displays depends on fixation *Moroz M., Garzorz I., Folmer E. & MacNeilage P*
- **2.4** A common cause in the phenomenological and sensorimotor correlates of body ownership *Samad, M., Parise, C., Keller, S. & Di Luca, M.*
- **2.5** The balance of evidence: Estimating the influence of contributors to cybersickness *Weech, S., Varghese, J.P., Duncan, R.E. & Barnett-Cowan, M.*
- **2.6 Rubber hand/foot illusion in older adults** *Teramoto, W. & Hide, M.*
- 2.7 An Audio Game to Help Children and Young People in Developing Cognitive Associations between Sounds and Words

Setti,W., Cuturi, L. F., Cocchi, E. & Gori,M.

- 2.8 Audio-haptic cue integration across the lifespan Scheller, M., Proulx, M.J. & Petrini, K.
- **2.9** Mechanisms of audiovisual integration in younger and healthy older adults *Jones, S.A., Beierholm, U. & Noppeney, U.*
- **2.10** Age-related brain changes in multisensory representation of hand movement Landelle, C., Sein, J., Nazarian, B., Anton, J.L., Félician, O. & Kavounoudias, A.
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Campos, C.

- **2.12** Two Signals For Hand Localization No Optimal Integration 't Hart, B.M. & Henriques, D.Y.P.
- 2.13 Changes in the Perception of the Peripersonal Space during Pregnancy *Cardini, F., Fatemi-Ghomi, N., Gooch, V. & Aspell, J.E.*
- 2.14 Multisensory influences in locomotor development *Schmuckler, M. A.*
- 2.15 Maintained cross-modal control in aging: Unimodal and cross-modal interference follow different lifespan trajectories

Hirst, R.J., Allen, H.A. & Cragg, L

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2.16 Altered Audiovisual Processing and Perception following a Loss of Inhibition in the Multisensory Cortex of the Rat

Schormans, A.L. & Allman, B.L.

2.17 Pre-attentive and Perceptual Audiovisual Temporal Processing in Rats Lacking the Autism Candidate Gene CNTNAP2

Scott, K., Schormans, A., Schmid, S. & Allman, B.

2.18 Facilitation of speech-in-noise perception from visual analogue of the acoustic amplitude envelope

Yuan, Y. & Lotto, A. J.

- **2.19** Frontal lobe network contributions to auditory and visual cognition Noyce, A.L., Tobyne, S.M., Michalka, S.W., Shinn-Cunningham, B.G. & Somers, D.C.
- **2.20** Recalibration of vocal affect by a dynamic or static face *Baart, M., Keetels, M. & Vroomen, J.*
- **2.21** Optimal multisensory integration precedes optimal time estimation *Murai, Y. & Yotsumoto, Y.*
- 2.22 When does the brain integrate signals from vision and audition in line with the predictions of maximum likelihood estimation? Meijer, D. &Noppeney, U.
- **2.23** Revealing audiovisual integration with the drift diffusion model Murray, C.A., Tahden, M.A.S., Glicksohn, A., Larrea-Mancera, S., Seitz, A.R. & Shams, L.
- 2.24 How input modality and visual experience affect the neural encoding of categorical knowledge

Mattioni, S., Rezk, M., Cuculiza Mendoza, K., Battal, C., Bottini, R., van Ackeren, M., Oosterhof, N.N. & Collignon, O.

2.25 Short and long-term visual deprivation leads to adapted use of audiovisual information for face-voice recognition

Moro, S.S., Hoover, A.E.N. & Steeves, J.K E.

- 2.26 An Electroencephalography Investigation of the Differential Effects of Visual versus Auditory Distractors on Crossmodal Temporal Acuity Kwakye, L.D., Hirabayashi, K.K., Barnes-Scott, Z. & Papadakis, S.L.
- **2.27** Perceived simultaneity of audio-visual events depends on the relative stimulus intensity. Horsfall, R.P., Wuerger, S.M. & Meyer, G.F.
- 2.28 Hearing that voice and seeing that face: the role of non-affective characteristics in person identification.

Jicol, C., Little, A.(1), Petrini, K.(1,2) & Proulx, M.J.(1,2) (1,2) Joint senior authors

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- **2.29 Development of cultural differences in emotion perception from faces and voices** *Tanaka, A., Kawahara, M. & Sauter, D.*
- **2.30** Sensory Rate Perception Simply the sum of its parts? *Motala, A. & Whitaker, D.*
- **2.31** Multi-modal representation of visual and auditory motion directions in hMT+/V5. *Rezk, M., Cattoir, S., Battal, C. & Collignon, O.*
- 2.32 Changes in resting-state connectivity in deaf individuals after learning a second (sign) language

Cardin, V., Kremneva, E., Komarova, A., Vinogradova, V., Davidenko, T., Turner, B. & Woll, B.

2.33 Sight restoration in congenitally blind individuals: multisensory perception for action execution

Senna, I., Pfister, S. & Ernst, M.

- **2.34** Increased recruitment of rSTS for tactile motion processing in early deaf individuals *Scurry, A.N., Huber, E. & Jiang, F.*
- **2.35** Elucidating responses to non-visual motion cues in hMT+ of early blind and sighted adults. *Barrett, M.M. & Rauschecker, J.P.*
- 2.36 Peripheral, task-irrelevant sounds activate contralateral visual cortex even in blind individuals.

Amadeo, M.B., Störmer, V.S., Campus C. & Gori, M.

- **2.37** Audio-Spatial Representation is Altered in Patients with Central Scotoma *Ahmad, H., Setti, W., Capris, E., Facchini, V. & Gori, M.*
- **2.38** Influence of visual experience on auditory spatial representation around the body *Aggius-Vella, E., Campus, C. & Gori, M.*
- 2.39 A comparison of neural responses to visual stimulation in congenitally deaf, neonataly deafened and hearing cats measured in MRI *Levine, A.T., Butler, B.A. & Lomber, S.G.*
- **2.40 Consonant-Order Reversals in the McGurk Combination Illusion** *Gil-Carvajal, J. C., Dau, T. & Andersen, T.*
- **2.41** A probabilistic model for modulated speech encoding in the McGurk effect *Karthikeyan, G., Plass, J., Ahn, E., Rakochi, A., Stacey, W. & Brang, D.*
- 2.42 Word Frequency and the McGurk Effect Dorsi, J., Rosenblum, L. & Chee, S.
- **2.43** Synchronized visual and olfactory stimuli induce VR-based out-of-body experiences *Yasushi A. & Hiroki O.*
- 2.44 Olfactory Input Influences Intranasal Somatosensory Perception Karunanayaka P., Lu J. & Sathian K.

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- **2.45** Party music and drinking decisions: multisensory effects of alcohol-related cues *James, T.W. & Nikoulina, A.*
- **2.46** Differential effects of music and pictures on taste perception an fMRI study *Callan, A., Callan, D. & Ando, H.*
- 2.47 Comparing the effects of vision and smell in red wine quality judgments by experts: constrained tasting vs. unconstrained tasting *Caissie, A., De Revel, G. & Tempère, S.*
- **2.48** Acute pain does not disrupt updating of peripersonal space and body representation *Halicka, M., Proulx, M.J., Wilson, M., Buckingham, G. & Bultitude, J.*
- 2.49 Visual Assessment of Tactile Roughness Intensity Kim, J.(1,2,3), Bülthoff, I.(1) & Bülthoff, H.H.(1)
- 2.50 Predicting the endpoint of an ongoing reaching movement: You need more than vision but do you really need to plan the action? Kumawat, A.S., Manson, G.A., Welsh, T N. & Tremblay L.
- **2.51** The duration aftereffect occurs in tactile modality *Li B. & Chen L.*
- **2.52** Haptic-visual interactions for stiffness perception in the human cerebral cortex studied with an fMRI-compatible pinch device *Liu J., Callan A., Wada A. & Ando A.*
- **2.53** Apparent increase in lips size improves tactile discrimination *Ambron E.A., Medina J.M., Coyle M.C. & Coslett, H.B.C.*
- 2.54 Differential Importance of Visual and Haptic Information in Postural Control among Different Standing Postures

Cheung, T.C.K., Bhati, P., Jenish, C. & Schmuckler, M.A.

2.55 Multisensory benefits and multisensory interactions are not equivalent: A comparative, model-based approach

Innes, B.R. & Otto, T. U.

- **2.56** Leveraging multisensory neurons and circuits in assessing theories of consciousness Noel, J.P., Ishizawa, Y., Patel, S.R., Brown, E.N., Eskandar, E.N. & Wallace, M.T.
- **2.57** A Simple Law that Governs Most Multisensory Amplifications and Enhancements *Billock, V.A. & Havig, P.R.*
- 2.58 A perspective on two potential mechanisms underlying different modes of multisensory integration Nidiffer, A.R., Ramachandran, R. & Wallace, M.T.
- **2.59** An analysis and modelling toolbox to study multisensory response times *Otto, T.U.*

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2.60 A neurocomputational model of synapse maturation explains Bayesian estimate and causal inference in a multisensory environment

Cuppini, C., Magosso, E. & Ursino, M.

2.61 Dynamic decoding of unisensory and multisensory stimulus processing in conscious and unconscious primate cortex

Tovar, D.A., Noel, J.P., Ishizawa, Y., Patel, S.R., Brown, E.N., Eskandar, E.N. & Wallace, M.T.

- **2.62** Therapeutic applications: Dance in the treatment of neurodegenerative and chronic disorders *Barnstaple, R., Fontenasi, C. & DeSouza, J.*
- 2.63 Visual and auditory cueing of learnt dance choreography in expert dancers and people with Parkinson's disease (PD). DeSouza, J.F.X.
- **2.64** A new approach to compare the quality of allocentric and egocentric spatial navigation *Bock, O. & Fricke, M.*
- **2.65** The Influence of Dance for Young Adults with Disabilities Andrew, R.-A., Reinders, N.J., Fisher-Stitt, N., Reaume, G. & DeSouza, J.F.X.
- **2.66 Distance perception of an object that moves with you** *Kim, J. J. & Harris, H. R.*
- **2.67** The sound of us walking together in time and space: Exploring how temporal coupling affects represented body size, peripersonal and interpersonal space in group interactions *Fairhurst M.F.*, Tajadura-Jiménez, A.*, Keller, P.E. & Deroy, O.*

* Shared 1st authorship

- 2.68 Is Attentional Resource Allocation Across Sensory Modalities Task-Dependent? Wahn, B. & König, P.
- **2.69** Visual-Inertial interactions in the perception of translational motion *de Winkel, K.N. & Bülthoff, H.H.*
- **2.70** Listening to a conversation with aggressive content expands the interpersonal space *Vagnoni, E., Lewis, J., Tajadura-Jiménez, A. & Cardini, F.*
- 2.71 Social modulation of audiotactile integration near the body Hobeika L., Taffou M. & Viaud-Delmon, I.
- **2.72** Modulation of Self-recognition by Interpersonal Synchronization *Hao, Q., Ora, H., Ogawa, K., Amano, S. & Miyake, Y.*
- **2.73** The use of egocentric and gravicentric cues to perceived vertical in the absence of tactile cues *Bury, N., Harris, L.R. & Bock, O.*
- **2.74** Auditory roughness impacts the coding of peri-personal space *Taffou, M., Suied, C. & Viaud-Delmon, I.*

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- **2.75** Neural signatures of processing noun phrases and contextual plausibility *Xia, A., Barbu, R., Singh, R., Toivonen, I. & Van Benthem, K.*
- **2.76** Factors influencing the uptake of co-speech gestures in real-time language processing *Saryazdi, R. & Chambers, C. G.*
- **2.77** Indexing Multisensory Integration of Natural Speech using Canonical Correlation Analysis O'Sullivan, A.E., Crosse, M.J., Di Liberto, G.M. & Lalor, E.C.
- **2.78** Language, but not race induces vocal superiority in audiovisual emotion perception *Kawahara, M., Yamamoto, H.W. & Tanaka, A.*
- 2.79 The visual speech advantage in noise: Effects of listener age, seeing two talkers and spatial cuing

Beadle, J., Davis, C. & Kim, J

- **2.80** Audiovisual Integration of Subphonemic Frequency Cues in Speech Perception *Plass, J., Brang, D., Suzuki, S. & Grabowecky, M.*
- 2.81 Using infant-directed speech to convey meaning: prosodic correlates to visual properties of objects

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- **2.82** Is integration of audiovisual speech fixed or flexible? *Tiippana, K., Kurki, I. & Peromaa, T.*
- 2.83 Perceiving your own shadowers' speech Chee, S., Dorsi, J., Rosenblum, L.D. & Dias, J.W.
- **2.84 Examining Modality Differences in Timing to test the Pacemaker Explanation** *Williams, E.A., Yüksel E.M., Stewart, A.J. & Jones, L.A.*
- **2.85** Synesthesia: Seeing the world differently, a phenomenological report *Steen, C. J.*
- 2.86 Perceived depth reversal in a motion parallax display when observers fixated on different depth planes

Sakurai, K., Neysiani, N.Z., Beaudot, W. & Ono, H.

- 2.87 Central fatiguing mechanisms are responsible for decreases in hand proprioceptive acuity following shoulder muscle fatigue Sadler, C.M. & Cressman, E.K.
- 2.88 Co-designing Serious Games in the Surgical Environment to Address Multisensory Communication Styles and Team Experiences Jordan, C.
- 2.89 Do movement sequences and consequences facilitate dual adaptation of opposing visuomotor rotations?

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- **2.90** Crossmodal correspondences are spontaneously used to communicate in a coordination task *Vesper, C., Schmitz, L. & Knoblich, G.*
- 2.91 Explicit contributions to visuomotor adaptation transfer between limbs regardless of instructions

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- **2.92** Contributions of online and offline processes to reaching in typical versus novel environments *Wijeyaratnam, D.O., Chua, R. & Cressman, E.K.*
- 2.93 Interindividual Differences in Eye Movements Made During Face Viewing Are Consistent Across Task And Stimulus Manipulations Wegner-Clemens, K., Rennig, J., Magnotti, J.F. & Beauchamp, M.S.
- 2.94 The relative role of visual self-motion feedback and biological sex identification on the sense of self

Schettler, A., Holstead, I., Turri, J. & Barnett-Cowan, M.

2.95 Multisensory stochastic facilitation: Effect of thresholds and reaction times *Harrar, V., Lugo, J.E., Doti, R. & Faubert, J.*

Student Travel Award Winners

The IMRF 2018 Organizing Committee would like to thank Plexon for the Student Travel Awards Sponsorship 2018 that will be \$500 for each student.

The student travel award winners are:

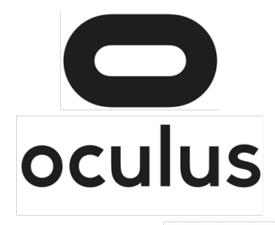
Maria Gallagher from Royal Holloway University of London "Virtual Reality modulates vestibular brain responses" Poster number 2.1

April Ching from Western Sydney University "Auditory-visual integration during the attentional blink: an event-related potential study" Poster number 1.78



Notes	

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