

43rd European Conference on Visual Perception (ECVP) 2021 Online

Perception

2021, Vol. 50(1S) 1–244

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DOI: 10.1177/03010066211059887

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Welcome Address

Welcome to the 43rd European Conference on Visual Perception (ECVP2021)! The tradition of holding an annual European Conference on Visual Perception has its origins in the “Workshop on Sensory and Perceptual Processes” that was held in Marburg, Germany in 1978 and organised by Dick Cavonius, John Mollon, Ingo Rentschler and Lothar Spillmann. The following year, a second meeting was held in Noordwijkerhout in the Netherlands and that established the practice of holding an ECVP meeting in a different European town or city and organised by academics and researchers in the local University. Uniquely, ECVP has no permanent organisation and, as a consequence, each meeting has been different and reflective of the ideas and interests of the local organisers. But the underlying goal has remained the same: i.e. to provide a forum for the presentation and discussion of new developments in our understanding of human, animal and machine vision, and an occasion where empirical, theoretical and applied perspectives of visual processing are presented and open for lively discussion.

At those early meetings, most of the presentations were from researchers in the UK, Germany, Belgium, France, Italy and the Netherlands but very soon ECVP became a truly international meeting with participants from all over the world. As a result of Richard Gregory’s friendship with Adam Gelbtuch and his publishing company Pion, ECVP established a close link with the journal *Perception*, and the journal has published the ECVP Abstracts from nearly every meeting since the 1980’s. There have also been many changes to ECVP in the 43 years since that first meeting - changes in the topics of greatest interest as well as changes in the technologies that have allowed us to study perception in different ways.

However, the Covid-19 epidemic created possibly the most significant challenge that ECVP has ever faced - the decision of whether to hold the 2021 meeting ONLINE. At the end of March 2021 (just five months before the start of the meeting), a group of ~40 individuals (including many who shared their experiences as past organisers of ECVP) met on Zoom to discuss the pro and cons of holding an online ECVP. There were many different opinions but one thing became obvious - no single individual could possibly organise such a meeting in such a short amount of time. The result - a group of 11 of us (the “Team”) offered to plan and organise an online ECVP2021.

As none of us had previously organised an online meeting, there were many challenges. One of our first decisions was to restrict the timing of the talk sessions to just three hours in the afternoon (CEST) so that these could be heard live by attendees from the west coast of the USA to Australia and New Zealand. Second, we wanted the talk presentations to be given live (rather than recorded) in order to make the meeting more like the friendly and positive atmosphere of previous ECVP meetings. Third, the decision not to charge conference fees meant that the website (www.ecvp2021.org), registration and abstract submission systems, Zoom channels, online poster platforms etc., had to be created and maintained directly by members of the organising team and their respective institutions.

We initially thought that the conference might attract ~500 Abstract submissions and we thought that there would be some 800-1000 registrations. As it turned out, there were nearly 650 Abstract submissions and over 1900 registrations. After an extensive review process conducted by the session chairs and scientific

committee, the meeting hosted 150 talks, 3 Keynote speaker lectures, 2 symposia, a “Showtime!”, a “Gathertown” meeting place and a total of 490 posters.

You will see below the abstracts of the scientific presentations. All of the abstracts were carefully evaluated according to pre-defined criteria by experts in the respective fields of research. We are extremely grateful to our session chairs and co-chairs and to all our colleagues who donated their time and energy to make ECVP2021 possible. We would also like to thank our exhibitors and sponsors for their financial contributions and in particular Sage Publications (publishers of Perception and i-Perception) for their on-going and generous support of ECVP.

The organising Team of the 43rd ECVP invites you to engage in the open-science interaction that is available to all, either by viewing the Abstracts in the electronic booklet below, or by interacting with the online materials that remain available via www.ecvp2021.org, www.ecvp.eu and our OSF video platform: <https://osf.io/8tb9x/>

Brian Rogers, on behalf of the ECVP 2021 Organising Team:

Tiziano Agostini, Marco Bertamini, Claus-Christian Carbon, Cristina de la Malla, Dražen Domijan, Mark Greenlee, Michael Herzog, Brian Rogers, Katherine Storrs, Ian Thornton & Sunčica Zdravković.

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Worst does not mean useless: The dynamics and rehabilitation of eye movements in macular degeneration

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Macular degeneration (MD) causes a central visual loss with an eccentric fixation and a radical change in the characteristics of eye movements. In this study, a mobile eye tracker was used to record fixation stability and saccadic eye movements with the head on a chin rest. By comparing the performance of a group of 11 subjects without any visual problem and a group of 20 subjects with MD to a task where they were asked to track the appearance of a circle of 1.5° of visual angle, repeated both in conditions binocular and in monocular conditions in which the best eye was used (or the dominant eye for healthy subjects), we observed that the ocular dynamics of people with MD present a heterogeneous picture in which some present only one eccentric locus of fixation, others have two or three relatively stable loci. The monocular data are compatible with those detected at microperimetry and are repeatable as shown in the retest. In all pathological cases, saccades were longer and slower and the fixation stability was lower than in non-pathological ones, and it is interesting to note that in the binocular condition these parameters approach that of healthy people. This observation has very important implications in the clinical practice since, generally, rehabilitation occurs only for the best eye, when instead even the worst eye seems important for people's quality of vision. [The authors have no conflicts of interest to declare.]

Visual acuity assessment with 3-bar optotypes: benefits and shortages

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Visual acuity (VA) measurements are always influenced by various factors, and one of the most important issues is usually the choice of a proper optotype. In our group, we have conducted several studies on comparison of 3-bar grating-like optotypes with Lea optotypes, tumbling-E, and letters (used in ETDRS and Russian Sivtsev-Golovin charts). In this work we want to overview and discuss the differences of VA assessment results obtained in three previous studies. One study was conducted on healthy young subjects (N=26, median age 17 yrs); another

study was conducted on children with ophthalmopathy (N=42, median age 10 yrs); and the third study was conducted on cataract patients (N=79, median age 78 yrs). According to our results, there was significant overestimation of VA with gratings (compared to tumbling-E and ETDRS) only in the cataract patients; other groups showed no significant differences between grating and other optotypes. We suppose that such advantage of gratings could be explained by relative easiness in perception of gratings for cataract patients: their responses to the 3-bar optotypes were faster and more confident than to tumbling-E and ETDRS-letters. In contrast, in children with ophthalmopathy, 3-bar optotypes were not so beneficial, since the patients were sometimes bored by repetition and lost their concentration faster. We may conclude that 3-bar optotypes may be used in various age groups, show comparable results, and may be even more convenient in some patients. [We are very grateful to Prof. Rozhkova for her comments and very helpful discussion.]

Do smaller P300 amplitudes in Schizophrenia Spectrum Disorder result from larger phase variability?

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The P300 is an event-related potential (ERP) that is typically evoked about 300 ms after onset of a rare task-relevant stimulus. It is interpreted as reflecting context updating and/or perceptual decision processes. Several studies found reduced P300 amplitudes in patients with Schizophrenia Spectrum Disorder (SSD) compared to neurotypical controls (NTs). The purpose of the present study was to investigate whether reduced P300 amplitudes result from reduced neural activity or from reduced phase coherence across trials. Different sized checkerboards were presented as frequent and rare task-relevant stimuli in an oddball paradigm. Eight patients with SSD and 12 neurotypical controls observed the checkerboards and counted the number of oddballs. P300 amplitudes, power and inter-trial phase coherence (ITC) in the delta and theta frequency bands were compared between participant groups. An ERP analysis revealed a typical P300 with a tendency for smaller amplitudes in the SSD group compared to the NTs. In the frequency domain, we found reduced ITC ($p = 0.0049$, $d = 1.142$) and even a tendency for larger power in the delta band in the patients compared to the NTs. The present results are yet constrained by the small sample size. The preliminary results indicate either equal or larger P300 amplitudes in the single trial but more variability in P300 latency in patients with SSD