



The Lee-Ryan Eye Hand Coordination Test App

Now available from the iTunes App store: [just click here](#)

The virtues of this particular EHC test

The L-R EHC Test focusses on eye-hand coordination when just fine motor hand movements are being used within the one plane. This strategy restricts contributions from gross arm and shoulder movements that can be a significant confounder for most other EHC tests. In addition, input through stereopsis is minimal in the L-R EHC Test and the absence of good stereopsis is in itself unlikely to be a constraining factor.

Instructions:

Note: This app is suitable only for iPad released in the last few years (original size or larger, not the mini).

Caution: If the participant is fitted with an electronic medical device, do not use a stylus using Bluetooth® for tracing (e.g. an iPencil).

1. Sit your participant at a desk wearing habitual correction (+ readers if necessary), holding the stylus in their preferred hand with the iPad approx. 33-40 cm from their eyes
2. Initially test binocularly. Repeat monocularly if desired.
3. Click on the shapes you wish to constitute your EHC assessment from the selection panels (note: your order of selection equates to the exact order of presentation to the subject)
4. Allow one practice trace (e.g. the Castle shape) to allow for a learning effect.
5. Say *“Sit still, and starting from the cherry, do your best to trace the line as fast as you can without lifting the stylus off the iPad and taking care on tight corners, because the number of mistakes you make and the time you take will be saved by the computer. You will be able to take a rest in between tracing each shape if you want.”*
6. Encourage your participant to start each trace within 5 seconds of the new shape appearing to minimize visual rehearsal effects.
7. At the conclusion of each trace either manually record time taken and number of errors made, or, email the data set to yourself (an option primarily for researchers). From the downloaded data, for each shape one can see: (i) the last time entry equates total time taken, (ii) the number of times ‘NEW’ appears in the ‘Errors’ column equates to the number of errors made, (iii) the possibility to graph the expected versus real x,y locations traced and thus visualise at a later date where the participant actually traced.
8. Population norms are currently being established and with the proceeds from the sale of the app, the population expecteds will be integrated into an update of the app in due course. The norms will also be made available on this website.
9. For further information or to offer feedback towards programming upgrades contact Barbara Junghans B.junghans@unsw.edu.au or ehc@unsw.edu.au

Background:

The L-R EHC Test for iPad was conceived by Kiseok Robin Lee during his PhD candidacy at the School of

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Optometry and Vision Science and designed by Dr Malcolm Ryan from the School of Computing Science and Engineering at UNSW, with support from Dr Catherine Suttle, Dr Barbara Junghans and Dr Sieu Khuu at SOVS.

Using a games-like approach, this app objectively tests eye-hand coordination in children and adults, and may thus provide sensory-motor information relevant to a range of medical conditions that affect vision and motor-coordination. The development of the app and its reliability and repeatability has been described and the mathematical degrees of difficulty of the various animal plates have been verified through empirical studies of performance in adults and children (*Development of a novel approach to the assessment of eye-hand coordination*. K Lee, BM Junghans, M Ryan, S Khuu, CM. Suttle. *J Neurosci Methods* 228 (2014) 50–56 available from B.junghans@unsw.edu.au). There is preliminary evidence that performance on the L-R EHC Test differentiates between those with normal vision and those with amblyopia or poorly treated amblyopia.

Therefore, this app may be useful to optometrists, ophthalmologists, orthoptists, paediatricians, neurologists, psychologists, rehabilitation specialists and remedial educationalists.

What constitutes expected levels of performance is currently under investigation at the School, and the results will be available on this website, as well as being integrated into the app itself in due course. The App may be used prior to, or after, interventional training. However, at this stage there is no evidence to support the use of the L-R EHC App as a training tool for eye-hand coordination.

You may purchase the **L-R EHC Test** app for \$2.99 from iTunes ([just click here](#)). We welcome feedback on any aspect of this app and its use – simply email Dr Barbara Junghans and Dr Sieu Khuu at School of Optometry and Vision Science, UNSW Australia, on ehc@unsw.edu.au

Donations towards upgrades of the EHC app

We would like to improve the EHC Test app so that it fits as many purposes as possible. In particular, to integrate a comparison with the expected population norm for age alongside the specification of time taken and the number of errors made after each trace. Tax-free donations to fund further development of this app can be made into the specific EHC-App Account at the UNSW Foundation:

[https://www.donate.unsw.edu.au/donate/form/donate_unsw.html?Fund=Eye Hand Coordination App Fund](https://www.donate.unsw.edu.au/donate/form/donate_unsw.html?Fund=Eye+Hand+Coordination+App+Fund)

