

Lertap Reviews

Larry Nelson

Curtin University of Technology

Document date: 20 July 2005

website: www.larrynelsonstuff.com/lertap/

As of the date above, there have been three formal reviews of Lertap 5, one by a doctoral student at the University of Alberta, Canada, and two by university professors: Nathan Carr at Fullerton State University, California, and John Poggio at the University of Kansas.

The Alberta review appeared in October, 2002, published in the newsletter of the CERA, Canadian Educational Research Association. [Click here](#) to see it.

The Carr review was completed in July, 2003, destined for publishing in the software reviews section of the International Journal of Testing. As of September, 2004, the review had yet to appear in the journal; I now understand that it will be published in Volume 4 (2), expected later this year. However, when it does appear in IJT, we won't be able to peruse it online as IJT does not maintain electronic copies of its editions.

Update 10 October 2004: the Carr review has been published in the International Journal of Testing, 2004, Vol.4, No.2, Pages 189-195. It may be obtained, at cost, by visiting the [IJT website](#).

Professors Carr and Poggio have kindly agreed to allow their reviews, or portions of them, to be re-"printed" here.

The Carr Review

Nathan Carr's review of version 5.2 of Lertap comprises over eight pages when printed from its source, a Microsoft Word document. The review is, I would say, almost overwhelmingly positive. Here are selected extracts:

.... what makes Lertap so valuable: It allows users to perform a wide array of classical item and reliability analyses in Excel without having to spend hours creating formulas and specifying ranges. For an Excel "power user," Lertap can save a considerable amount of time. For a novice Excel user, on the other hand, Lertap could bring a number of difficult, tedious, or essentially impossible analyses within reach. Furthermore, the fact that all reports are formatted Excel spreadsheets means that the program's output can be printed directly from Excel, with page breaks and page orientations easily previewed and changed. Results are easily transferred from Excel to Microsoft Word or Power Point documents as well.

The manual is an easy read, and is sufficiently chatty that readers may soon find themselves “hearing” the text with an Australian accent. Given the evident care with which the manual was written, the informal touch was probably used to reduce the anxiety of statistical novices and keep the presentation as nonthreatening as possible.

The manual does not pretend to be a measurement textbook, but it certainly provides more than might be expected from a computer manual.

Lertap 5 makes no claims about being anything beyond an application for scoring and performing reliability analyses at the test and item levels, but within those limitations it performs very well, and can be quite useful to anyone who wants to do classical analyses of reliability. Its use of the Excel interface, which facilitates both opening and saving data in a wide variety of file types, is also a definite plus. Most noteworthy of all, though, may be that the program and manual are sufficiently user-friendly that users with little or no background or training in either measurement or Excel should be able to master and use Lertap in relatively short order.

To summarize, Lertap 5 is a fairly solid program that performs a wide variety of item and test analysis functions using the ubiquitous Microsoft Excel interface. Aside from some minor glitches, the program is reliable and thorough. Dedicated Excel users will probably love this program, as will anyone who has had to do item scoring or analysis with do-it-yourself spreadsheets or less-than-optimal interfaces in other programs. For those with little background in testing or measurement who suddenly find themselves needing to analyze items, tests, or surveys, though, Lertap 5 may be a lifesaver. The full version is available at the Assessment Systems website (www.assess.com) on a 30-day trial basis, and is well worth checking out.

Update 1 March 2014: users with Excel 2010 and Excel 2013 (both Windows versions of Excel), may now download the so-called **Mini** version of Lertap. It has no time limit at all, but is limited to processing no more than 50 data records, a limit which is easily removed by purchasing a license. [Click for more information.](#)

Minor glitches? Yes, Dr Carr found a few. Under an “Areas for Improvement” section, he cited these matters:

Despite its strengths, however, Lertap still has a few minor things that could stand to be improved. These are all minor points, fortunately. Perhaps the most important one is that in the course of testing the program for this review, using the histogram button on the Lertap toolbar caused Excel 97 (running in Windows XP Home Edition) to crash when graphing polytomous items. This is particularly a shame, as the Excel Histogram tool (in the Data Analysis ToolPak) can be hard to figure out. It appears, however, that this problem is limited to Excel 97, and does not affect subsequent versions of the program.

In addition, there can be problems with the discrimination estimates (point-biserial correlation coefficients) when a subtest contains polytomous items—on

the brief item statistics page, the results for dichotomous items from a test that includes polytomous items can differ from those for the correct option on the full statistics page. This stems from the correction for part-whole inflation, but can be avoided by individually weighting all items (using the “*mws” command) according to their maximum point values.

Several other issues involve things the manual should perhaps have mentioned but failed to, or did not mention prominently enough. One such omission is that the manual does not warn users until Chapter 9 of the manual—although the Lelp tutorial does caution against this in its discussion of the Sort button—that once they have already begun their analyses, they should not sort data or scores using the usual Sort function in Excel. Instead, they should use the Sort button on the Lertap toolbar, or create a copy of the Scores or Data worksheet with a different name and sort that. To prevent users from making this mistake, the manual should warn users against using the “normal” Sort function in Chapter 2 when it discusses sorting.

Nelson Comments on Carr Review

I am of course grateful for Professor Carr’s review and comments.

In the process of writing his review, Dr Carr and I exchanged a number of email messages. These were largely prompted by questions related to the limitations his review mentions. But his review also led to improvements in Lertap – he doesn’t mention that he found Lertap’s calculation of item difficulty for polytomous items to use a method different to that he’d ordinarily employ.

What’s a polytomous cognitive item? Briefly, one which is scored in a manner which is not simply dichotomous, that is, an item which is scored on other than just a right/wrong basis.

After receiving Dr Carr’s comments on item difficulty calculations, Lertap was enhanced so as to better accommodate the polytomous case. There are now three user-selectable ways for calculating the difficulty of a cognitive item, with the default method being that favoured by Professor Carr (for more information, search Lertap’s online help file, [Lelp](#), for “polytomous” item scoring).

The Lertap histogram problems with Excel 97 mentioned in the review have been repaired, at least in part. Excel 97, along with Excel X for the Macintosh, has a bug which limits the number of Excel charts a workbook may have. Microsoft released a fix for the Excel 97 case a few years ago, but Excel X for the Mac, a very recent version of Excel, remains plagued by this bug.

Update 1 March 2014: this problem, a limit on the number of charts which may be produced, has disappeared from the more recent versions of Excel for Windows (Excel 2007/2010/2013) and, it

seems, also from the latest version for Macintosh computers, Excel 2011.

The Poggio Review

Professor Poggio's (www.soe.ku.edu/faculty/Poggio.html) review of version 5.25 was presented to the Association of Test Publisher's Technology in Testing conference in Palm Springs, California, February, 2004. He compared three item analysis systems: StatItem, Lertap, and SPSS, providing the conference audience with a rich display of sample output from all three programs.

Dr Poggio's ATP presentation has not been formally published. However, on request he has considerately provided Lertap HQ with a comprehensive summary of his Lertap review, sans the sample output screens. The evaluation section of his Lertap summary is repeated below; to see the whole thing, just [click here](#).

Professor Poggio's Lertap 5.25 evaluation follows:

Update 20 July 2005: Lertap prices have changed. As of August, 2005, an academic purchaser will be able to install Lertap on an additional personal computer at no additional cost.

Update 30 April 2014: Lertap prices have changed again. Please refer to this [reference](#) topic.

Strengths:

- Easily coded and control language is straightforward.
- If you are knowledgeable and facile with EXCEL, LERTAP will integrate very nicely.
- Statistics are common place and sound (including proportion estimates and biserials/point biserials).
- The Mastery test evaluations are nice to have and have so readily available.
- Handling of affective instruments nicely integrated.
- Item scoring options are an asset (reverse scoring affective items, scoring more than one option correct in MC items)
- Manuals are very informative (about item analysis) and helpful to the user.
- The "item banding" feature is a positive asset; it also flags problem items to aid the user.
- Nice job of handling missing data.
- Outputs files and charts are prepared as Excel files making for easy use when generating reports.

Shortcomings:

- If you are not comfortable with Excel, your ease of use index could be a major problem.
- You must own a copy of Excel...it does not operate apart from it.
- Only Cronbach alpha computed for reliability – other choices (split half, Guttman are needed)
- Hi-Low distractor analyses would be beneficial for some users.
- No internal flexibility for defining groups on whom to run analyses (e.g., examinees with 2 years in the local school, etc.)

Overall Evaluation:

A sound piece of software that merits serious consideration if a classical approach to test analysis is desired. The Mastery and Affective components add to the strength of the utilities. One very significant drawback is that it is very pricey (\$200 for academic users, \$400 for the private sector) and (here is the real problem) even after you buy it, it can only be installed on one machine (I have at least 3: home, school and my portable making purchase not only prohibitive, but inconsiderate)...You also need to be knowledgeable and a user of Excel. If you can overcome the limitation of being tied to Excel and only have this software on one computer on which work is done, Lertap deserves your attention and consideration.

Nelson Comments on Poggio Review

Naturally I appreciate Professor Poggio's review, and the special effort he made to get it to Lertap HQ.

No doubt there will be quite a few readers who, having had their work formally reviewed, find themselves wearing a wry smile after comparing reviewer findings. Professor Carr liked Lertap's Excel base, going so far as to suggest that even Excel tyros "should be able to master and use Lertap in relatively short order". Professor Poggio, on the other hand, seems to hint that the Excel base may be a problem for some.

Where might I stand on this issue? (Smile; I thought you'd never ask.) We've made a real effort to accommodate users who do not have Excel experience, and Nathan Carr thinks the effort shows. John Poggio is not so sure. At any rate, it's an easy matter to see how much Excel knowledge is required: Lertap may be tried for thirty days for free. The so-called "cook's tour" found in the manual's [second chapter](#) (another freebie) can quickly reveal how much or how little Excel nous is needed.

The Excel base adds tremendously to Lertap's utility. Excel has extensive built in routines for computing all sorts of statistics, such as averages, variances, and correlations. It also has a handy "charts" facility for making pretty pictures of results – bar charts, histograms, line graphs, and more.

In many ways, Lertap is an interface, a way-in, to the power of Excel (as Carr found). About two thirds of Lertap's calculations, and approximately 98.44% of its graphs, are made by Excel's intrinsic functions. Experienced Excel users are likely to realise this; others don't need to, not at all – we have tried as best possible to make Excel transparent to the inexperienced. But having said that, there's some reason to wonder what the big deal is: Excel is not a beast. People who work with tables in a word processor, such as Word, usually Excel-lently come over to the spreadsheet format without much of a blink at all. Some folks think that using Excel means having to write formulas in cells – nope, none of this stuff is required when using Lertap.

Concerning cost, Dr Poggio writes: "even after you buy it, it can only be installed on one machine". As of August 2005, this Poggio comment became inaccurate: academic purchasers may now install Lertap on a second computer at no cost.

A point about Lertap, Excel, and prices: let's think about the usual actions of a Lertap user – (1) a test or survey is administered, and data collected; (2) the data are entered into an Excel worksheet (or into some other system, and then imported to Excel); (3) Lertap is used to produce item and test analysis reports, and, if wanted, graphs; (4) the coffee / tea mug is filled up with a hot cuppa, the fire is stoked (or the fan started), shoes discarded, favourite music put on, and Lertap's reports are longingly, lovingly perused.

Three of these four common steps can be done without Lertap(!). Sure thing. As long as you've got Excel running on your computer, you only really need Lertap for the third step. Lertap's reports and graphs are written to an Excel "document", more correctly referred to as a workbook. The workbook can be read on any Excel-equipped computer – Lertap isn't required. The workbook can be sent to colleagues, posted on a website, shared with students – Lertap isn't required. New graphs and charts can be made in the workbook without needing additional access to Lertap. The statistics, tables, and charts found in Lertap's reports can be copied from the workbook to Word or PowerPoint without Lertap.

"I can prepare my data at home, without requiring Lertap?" You bet.

Prof. Poggio says that Lertap should offer more than alpha as a reliability estimate. It does – there's a spiffy example on the website of a study which used Lertap to get parallel-forms, or equivalent-forms, reliability; the same procedure would be used to obtain a test-retest figure.

Split-half reliability estimates? Can do, too – the halves become Lertap subtests. This ain't hard to do at all, but an example would surely help – watch for one such soon on the Lertap website.

Update 30 April 2014: using Lertap to calculate parallel-forms reliability is discussed in [this paper](#). An example of using Lertap to calculate split-half reliability is discussed in [this paper](#).

(For more about classical estimates of test reliability, please refer to the [Lertap references](#). Not many people use the old split-half procedures anymore; alpha has universal acceptance as the method of choice these days, at least when reliability is estimated from a single test administration. See Lord (1968) and Crocker and Algina (1986) for discussions of the problems with split-half approaches. Pedhazur and Schmelkin (1991) not only detail these problems, but go on to state that split-half reliability estimates are "...severely limited and should, therefore, be avoided..." (p.90).)

Dr Poggio suggests Lertap should have some "flexibility for defining groups on whom to run analyses", such as "examinees with 2 years in the local school". Well, Lertap 5 has always had a capability for doing this; examples are given in the manual, and in Lelp, Lertap help (the *tst control line is used to break out groups). I am sure this capability could be better "advertised", and, for that matter, improved so as to be more flexible when it comes to defining the groups. Look for this in one of the coming Lertap revisions.

Update 30 April 2014: significant enhancements have been made when it comes to getting Lertap to look at results for groups of test takers. It's now easy to [breakout test scores](#) by groups, to [breakout item responses](#) by groups, and even to look for "[DIF](#)", differential item functioning.

Another Poggio suggestion: "hi-low distractor analysis would be beneficial for some users". But hey(!), this is another capability found in Lertap 5 since the beginning of time – it has always produced the upper-lower, or high-low, distractor summary, and it's always been possible to set the percentage of test takers to be included in the groups. The latest version of what will become your favourite item analysis program (if it isn't already), Lertap 5.4, expands the upper-lower capabilities so that the high-low range can be redefined to include more groups, as many as five. Distractor trace lines are easily plotted now, with just a single mouse click; these lines graphically portray how the distractors perform in each group.

Lertap 5.4

Professors Carr and Poggio reviewed Lertap versions 5.2 and 5.25, respectively. There have been several enhancements to Lertap since the dates of their reviews, and these, I think, do much to advance Lertap's position as a classical workhorse, one quite capable of taking on fairly large scale test development tasks. (Such was its original role in life – the first versions of Lertap ran on mainframe computers, and were frequently used to process results from state and national assessments of educational progress.)

Foremost among recent changes would be Lertap's ability to plot the functioning of cognitive item options. The former upper-lower group analysis found in version 5.2 has been expanded so that it will summarise results for two, three, four, or five groups. Not only will Lertap make quintile-like frequency summaries for the groups, but it will graph response frequencies by item option over all groups. It will also allow the graph's axes to be swapped so that item options are laid along the x-axis, with response frequencies then plotted per group.

Lertap allows the groups in these plots to be defined on the basis of a categorical variable, such as gender or region, leading to plots capable of suggesting, should it exist, differential item functioning (DIF). (I think these graphs are really handy, having an authentic potential to put more shine on the way cognitive item functioning is assessed. You can see examples of them by clicking on the two URLs found below.)

Other enhancements in version 5.4 include: the ability to have Lertap compute item SMCs (squared multiple correlations); a tetrachoric correlation option; a capability for working with a free matrix algebra Excel Add-In, allowing eigenvalues to be extracted from a Lertap interitem correlation matrix; and interfaces which reformat a Lertap data set so that it will quickly be acceptable to two popular IRT programs: XCALIBRE, and Bilog-MG.

Further information about these changes may be seen in "[Lelp](#)", Lertap's online help system. Samples and examples may be seen at the [sample datasets](#) website, and also in a special Lertap [tips and tricks](#) website.

Larry Nelson
Curtin University
Perth, Western Australia
Email: larry@lertap5.com
Website: www.larrynelsonstuff.com/lertap/