BrainMaster Knowledge Base Article
Using the Swingle Clinical Q Assessment and Spreadsheet

by Gary Ames
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Paul Swingle Ph.D has tested and developed his Clinical Q. Paul Swingle, Gary Ames and Tom Collura are proud to offer this assessment tool to the BrainMaster community for free to all owners of Session Wizard on the Atlantis and Discovery platforms.

To use this assessment tool you will need the Session Wizard and either BrainMaster Atlantis or Discovery. You will need MS Windows Office Excel 2007 or later. It runs only on the PC operating system with XP or higher. To get full use you will need the OMNI sound from www.SoundHealthProducts.com.

The Clinical Q is not only a powerful assessment tool, it can mark progress across sessions and even indicate which areas to work on today. The former name QuickQ is now replaced by Clinical Q.

1. Clinical Q vs. QEEG
Both the Clinical Q and a full QEEG brain map acquire EEG data and analyze it for clinical purposes. However, the Clinical Q is different from a full QEEG brain map in several ways. The Clinical Q uses just one channel to collect 6 minutes of amplitude data from 5 sites. The Clinical Q has no connectivity data between pairs of sites.

The results of a Clinical Q are compared to a clinical database not general population norms, as are used in QEEGs. This means that Dr. Swingle has taken data from 700 clients who presented themselves to his clinic with psychological or health problems. He found 23 EEG values, ratios, or totals to be statistically significant markers for particular symptoms. This does not mean that the man on the street will share this correlation of values to symptoms.

A QEEG yields a rich set of data from 19 sites, more or less. QEEG data acquisition is exensive and cumbersome. QEEG interpretation for diagnosis and treatment requires more than a little expertise. The Clinical Q can be enough for 95% of the garden variety conditions seen by neurotherapists according to Dr. Paul Swingle. A full Q is recommended in cases of seizure activity and brain injury.

Both QEEG and Clinical Q can produce a training plan using the maxim: follow the map. They are both persuasive tools giving the therapist extraordinary credibility on the front end. Especially when compared with other mental health professionals. Can you treat the brain without looking at it? "Would you see a doctor without a stethoscope?" Both assessment methods provide useful clinical data to guide treatment.

2. Mindset for the Clinical Q

The Clinical Q changes the paradigm of patient expectations. Clients normally expect to come in, fill out some forms and tell the clinician what is wrong with them. Indeed they may mount evidence to sell the clinician that they need help in order to justify their visit. Neurotherapists often fight up hill to persuade clients that their unique technique is valid and useful.

When a neurotherapist uses the Clinical Q as the lead tool, all these dynamics are shifted. By all means, begin by having the client fill out your introductory forms. But Dr. Swingle advises not looking at them. Postpone any discussion of the forms or the client's problem areas until after EEG testing is done and discussed.

After conducting the Clinical Q you probe clients for particular symptoms based on neurological EEG markers. You should expect a startled or stunned response when you tell the client why they have come in today. "You can see that?" Your EEG neurofeedback method gains substantial credibility because it so aptly detects their problems. However, Dr. Swingle warns us: "A good tool does not a good clinician make".

You want to keep the mood light during the Clinical Q. Paul Swingle has been very generous in sharing his protocol and even his words that he uses in his sessions. He has one of the world's largest neurofeedback practices with over 1000 clients per month.

There are two books to help you understand the Clinical Q. Biofeedback for the Brain is targeted to the general population. I strongly encourage you to buy Basic Neurotherapy, The Clinician's Guide. This is the technical level book that goes into rich detail about the Clinical Q. It is available from www.SwingleandAssociates.com Here is a sample from the middle of a section entitled: "What I tell the client".

"I'm going to put a wire on each of your ears and one on top of your head that I move around. You won't feel anything as this is measurement only. I will ask you to open and close your eyes, read something for a brief period and I'm going to play a sound that sounds like "shush". After I record the data, I will do a few calculations and then go over the results with you in detail to determine if what the brain is telling me is consistent with your personal experience. Then we will figure out what form of treatments we can use to correct the problems."

3. Running the Clinical Q Assessment

You can start by preparing the sensors with 10-20 paste. You can clean the ear lobes and just CZ with Nu-Prep and a dab of 10-20 paste. Or you can prepare all 5 sites before you start: CZ, O1, F3, F4, FZ. You will also need a ground wire. When your hook up is complete go to the BrainMaster software.

From the opening BrainMaster screen go to "Folder Selection" and find "Swingle Assessment". Then "Run The Next Session".   This will bring up the Training/Control Screen. Press Go. This will check your module. You will get a master30 dialog box that starts "Number of periods in Session 30… Click OK. This brings up a dialog box telling you to Place sensor on CZ Eyes Open. When you click OK the program starts showing you data, but you have not begun until after the next dialog box which says: Module is Running! To Start the Session, Press OK When EEG Signal is Good!   You yourself should be still and collect data from just one location without moving. Having the client's feet on the floor is also helpful.

Check your Impedance with the green lights on your Atlantis. Or look at the top left of the screen and check impedence of the A1: value and R1: value. A1 is lead one and R1 is reference. You can use linked ears. If one of these numbers is too high then repair your connection until it is below 10 or 20. Wait until you see a good raw EEG signal without flat lines on top or bottom. Then click OK.   Dialog prompts guide you through the entire process outlined below.

You will see the clock start at 6:00 and begin counting down. This is assessment only; there are no training goals. At the end of the first measurement epoch you will always hear a sound after 15 seconds except for the last series at FZ which is 6 seconds. After 2 measurement epochs or 30 seconds the dialog box will say Done with Eyes Open for now.   The next epoch is with eyes closed for 15 seconds. Next is eyes open again.

At 5:00 elapsed time we come to the cognitive challenge for 45 seconds. This can be reading, or arithmetic task that requires concentration. Recordings from this period will appear under CZ as UT for Under Task. You can set your own method for challenge here depending on the age and capabilities of the client.

Dr. Swingle most often uses reading as the cognitive challenge. You will want several reading samples to be somewhat engaging to all ages and mental capacities of clients that you see. Sometimes I tell young clients to listen to and remember a poem that I recite. Alternatively you could use mathematical cognitive challenges such as asking the client to count by 7s or subtract serial 7s from 1000 and then report how far they got at the end of 45 seconds.

Next there is an eyes open epoch of 15 seconds followed by the Harmonic Test. You will need the OMNI sound from SoundHealthProducts.com. I turn this on with Windows Media Player for the 3 measurement epochs lasting 45 seconds. It plays through speakers and does not have to be loud. In some people the sound suppresses Theta waves and enhances concentration. When this is true, those people are encouraged to buy the sound sound (CD or MP3) and play it in the background to enhance quiet productivity.

Now turn off the sound. We are done with CZ. Move the sensor to O1. Wait for the signal to settle. Begin with eyes open. Next is eyes closed. Then eyes open again.

All remaining recordings are done with eyes closed. We move to F3 for 45 seconds followed by F4 for the same period. FZ is also done with eyes closed for the final 60 seconds.

When the clock reaches 0:00 there is a message saying "Finished!" You can close the training screen. On the Setup/Home Screen select Review Session Results. The results for the assessment you have just completed is there. There is no record of any prior assessments. The next assessment will overwrite the current one.

From BReview select Quick-File, not Excel Table, but Quick-File. This brings up a .csv spreadsheet with Runs or Epochs going down the rows and brain wave bands across the columns. Four kinds of data are repeated for each run: Mean, Mean Frequency, Standard Deviation and Modal Frequency.

In this Excel table go to File / Save As and change the default name from qat0001.csv to something that identifies the client. Keep the .csv filename extention. Place this file in a location where you can access it with Excel. Excel will warn you that this .csv file doesn't have features…. Save it anyway. Now you can close the spreadsheet. Excel now asks you if you want to save the changes you made. Answer No to exit. You have already saved what you want, where you want it.

There are no good work-arounds for the problem of bad data filled with artifact. The best and simplest option is to run the assessment over again.

4. Launching the Spreadsheet

Now open the ClinicalQv2.xlsm spreadsheet. The first time you do this, type over "Clinician" in cell A1. Enter your name or the name of your practice. This will appear on future spreadsheets.

Now save the sheet in a memorable place with a slightly altered name such as ClinicalQvMy2. Use this version of the spreadsheet from now on. Every time you will load the sheet with an old client's data and then replace it with a new client's data. You can use any prior client's sheet from the pull down menu and repopulate it.

In the upper left, at row 4 and 5, is a blue circle saying New Import. When you click this button you are prompted for a file location for the .csv spreadsheet with a standard Windows prompt. Navigate to the folder. This feature will populate the sheet with your client's data. If you select the wrong type of file you will get an error.

Type the client name in B5 and the date in B6. In cell F4 add any comments you wish such as diagnosis, medications, artifact notes, etc., etc.

5. Reading the Report

Legend: Abbreviations and Signs
All values are based on microvolts except for the peak alpha frequencies.
EO (Eyes Open) EC (Eyes Closed)
CADD (Common Attention Deficit Disorder)
OMNI a complex ambient sound is available from SoundHealthProducts.com
UT (Under Task) such as reading silently
T/B (Theta/Beta)
< less than, << much less than. > greater than, >> much greater than. ± either plus or minus.
CZ, O1, F3, F4, FZ refer to 10/20 chart of scalp locations.
The numerical values in column A are guidelines for normal values, that is, not clinically significant.

The Clinical Q uses non typical frequencies for assessment and training. This was simply found to be most useful by Dr. Swingle.

Delta	Theta	Alpha	Lo Alpha	Hi Alpha	SMR	Beta	HiBeta-Gamma
1.5-2.5	3-7	8-12	8-9	11-12	13-15	16-25	28-40

At first glance across the spreadsheet we see values, ratios, ! and probes.   Let's examine a few of these in detail.

The meat of the spreadsheet starts on row 9. Here we find the amplitude of Eyes Open Alpha at CZ in microvolts. Under the Value column is the median of the first two 15-second measurement epochs. Below that is Eyes Closed Alpha which is drawn from the 3rd measurement epoch. There is no clinical significance for these two values by themselves.

In row 11 we have "% Change from EO to EC Alpha >30%."   This ratio uses the values from B9 and B10. This is calculated as EC Alpha minus EO Alpha divided by the lesser of the EC or EO value. The >30% tells vaules above 30% are good and normal. And that the cut off for clinical significance are values below 30% difference between EC and EO Alpha.

When we get a value below 30% in cell C11, then there is a ! mark in probe column at E11. Column F11 tells us that if we see low or negative numbers here to ask about visual processing (memory) problems; poor retention of information and/or short term memory. We are also advised to look at the same calculation at O1 and read the EC to EO description in cell F33. The marker at O1 is about traumatic stress (below 50%) and the artist signature (above 150%). The comparison is significant clinical information.

The implication of a low number here is the recommendation to improve visual processing (memory) problem; poor retention of information and/or poor short term memory, by increasing the difference between Eyes Open to Eyes Closed Alpha at CZ from the current value to more than 30%.   This is done with neurofeedback training of Alpha both EO and EC.

Row 16 is more familiar ground. In 16D is the EO Theta/Beta ratio (3-7 Hz/16-25 Hz). These data are drawn from the first 2 measurement epochs. If this ratio is greater than 2.2 the ! flag appears and the probe says to ask about CAAD or common ADD. We are advised to look at the UT or Under Task probe in row 19.

The treatment recommendation is to reduce this ratio to below 2.2 with Theta/Beta training such as the BrainMaster Alert protocol at C3 or CZ or the Focus protocol or make your own protocol with Dr. Swingle's definition of brainwave bands.

Row 22 says that we want a Total Amplitude <60. Total Amplitude is the sum of Theta, Alpha and Beta (3-7 Hz + 8-12 Hz + 16-25 Hz). This value is the sum of the median of these 3 bands for all 10 epochs. A brain so busy as to have a total amplitude above 60 may well have developmental delays, autism, or marked cognitive deficits. You can write a training protocol to squash these 3 bands by rewarding lower values for those frequency bands.

Rows 26 and 27 use the BrainMaster's calculation of peak Alpha frequency EC and EO. This comes from the Modal Frequency data. We want this value high and certainly above 9.5. You might safely comment to people with a high peak Alpha Frequency that they are smart. Raising the peak Alpha Frequency is a different kind of neurofeedback than amplitude training. It is also different from LoAlpha/HiAlpha training. BrainMaster uses the event wizard for training up peak Alpha frequency.

At row 49 we have the first potentially significant value from either F3 or F4 with the Theta/Beta EC ratio. These values are drawn from the median of 3 epochs. An imbalance in this ratio on either side of the head will raise the same probe.

The treatment recommendation for a flag at row 49 and 53 has you raise a ratio with Theta in the numerator. Training up the Theta/Beta ratio or Theta/Alpha ratio has you increasing frontal Theta. Raising frontal Theta is sometimes cautioned against. But Dr. Swingle asserts this to be an indicated protocol and the proper treatment for those with these neurological markers and matching symptoms.

In rows 55, 56 and 57 we compare the amplitude of 3 bands at F3 compared with F4. We want values less than 15%±, that is less that 15% plus or minus. A positive number means that F4 (right front) is greater than F3 (left front) and a negative number tells us that F3 is a higher value than F4. +F4>F3; -F4<F3.

F3/F4 imbalances can be treated as values or ratios with one channel or two. You can also use frontal bi-polar placement protocols to reduce the difference in frequency amplitude between the right and left.

6 . Describing the Results to Clients

A Clinical Q interpretation is related to Cognitive Behavior Therapy. We radically reframe the client's problems as a defect in their electrophysiological profile. This is a new emotional belief. We assert that they can train their way out of these problems for an enduring solution. This is typically unexpected and most welcome news. Let it sink in.

The ADD adult with a chaotic career can now see that their Theta/Beta ratio at CZ is what has caused all their struggles with organization and follow through. More importantly they now have the power to overcome their shortcomings themselves. They can shed their rationales for inferiority and take substantial hope for a more productive life in the coming months.

The Clinical Q is only designed to allow you to ask questions, to probe as to why the client has come to see you for an initial meeting. Probe, don't tell. The questions are powerful enough. Less is more.

"This ratio usually indicates problems with organizing, sequencing, sustained focus, planning, task completion, staying on task, and talkativeness. Do any of these apply to you?"
"I see here a brain wave pattern that is common for people with a history of trauma. Is that true for you?"
"A lot of my people tell me this neurological marker is associated with sleep problems. Do you have trouble sleeping?"
"You have a lot of very fast brain waves in front. Are you stubborn?"

Again, be prepared for awestruck silence while the client absorbs what is happening. You may enjoy some snappy replies to the client question "How did you know that? Such as: 'The information is all there in the brain. Where did you think it would be?'

You may enjoy a matter of fact attitude. This is no problem to fix. Now that we know what the problem is and exactly where the problem lies, we can repair it. We will reverse the mechanism of action at the site of the disorder to decrease your symptoms over the long term. Be prepared for more honor and credibility with clients than you are accustomed to. Use this trust wisely and well. Harness the power of placebo.

A worthy clinician will not rely solely on the information from the Clinical Q. Without looking at any of the forms the client has filled out, there is plenty of information that walks through your door. The client's dress, appearance, demeanor, posture, speech, etc. speak volumes about who the client is and what brings them to your office. Use all this in your interpretation. This non-verbal information should be used for probes.

You may want to add this section to the third page of the spreadsheet along with other notes or treatment plans.

EO = Eyes Open, EC = Eyes Closed
< Less than. > Greater than. ± Either plus or minus.

Brainwave frequencies:
Delta 1.5-2.5 Hz
Theta 3-7 Hz
LoAlpha 8-9 Hz
Alpha 8-12 Hz
HiAlpha 11-12 Hz
SMR 13-15 Hz
Beta 16-25 Hz
HiBetaGamma 28-40 Hz
Total Amplitude = Theta + Alpha + Beta

7. Use Caution When Tinkering With the Spreadsheet

You will notice two tabs at the bottom left of the spreadsheet: report and input. You always see the report tab as default. The input tab contains all the raw data from the assessment acquisition session. Changes to values in the input tab are instantly reflected in the report.

You have 4 kinds of data for each of 30 epochs: Mean, MeanF, StdDev, and ModFreq.
The Mean is used most often. The data returned are most often the median of epochs. StdDev may be useful to detect excess artifact. ModFreq is modal frequency with .1 Hz bins within the band and is used to obtain the peak Alpha frequency.

The spreadsheet is locked and protected from entering any information from rows 7 to 68. You can unlock the report tab of the spreadsheet. The password is password. But I recommend you do not use this.

If you right click on the report or input tab you will see an option to Unhide. This will let you see the calc tab. Here are the guts of the excel macro and assessment report.

Beware of changing anything to the Report or Calc tabs. All saved changes will be a part of subsequent spreadsheets.

8. Order of Epochs and Events
1. CZ EO
2. CZ EO
3. CZ EC
4. CZ EO
5. CZ Cognitive Challenge
6. CZ Cognitive Challenge
7. CZ Cognitive Challenge
8. CZ EO
9. CZ Omni Sound normal level
10. CZ Omni Sound soft
11. O1 EO
12. O1 EO
13. O1 EC
14. O1 EO
15. F3 EC
16. F3 EC
17. F3 EC
18. F4 EC
19. F4 EC
20. F4 EC
21. FZ EC
22. FZ EC
23. FZ EC
24. FZ EC
25. FZ EC
26. FZ EC
27. FZ EC
28. FZ EC
29. FZ EC
30. FZ EC

9. Session Wizard Script

BrainMaster Session Wizard Control File
VERSION: 1
NAME: Swingle Assessment

COM: Use with 2E, 2EW, or Atlantis in 1 channel mode
COM: Cz
COM: O1
COM: F3
COM: F4
COM: Fz
COM: should be e.g. Cz A1 A2

NCHANS: 1

DO:
MESG1: Place sensor on Cz Eyes Open
SITES: Cz LE GND
PERIOD: 15
MESG2: Done with Eyes Open for now
SITES: Cz LE GND
PERIOD: 15
MESG1: Place sensor on Cz Eyes Closed
SITES: Cz LE GND
PERIOD: 15
MESG1: Place sensor on Cz Eyes Open
SITES: Cz LE GND
PERIOD: 15
MESG1: Place sensor on Cz Cognitive Challenge
SITES: Cz LE GND
PERIOD: 15
SITES: Cz LE GND
PERIOD: 15
MESG2: Done with Cognitive Challenge
SITES: Cz LE GND
PERIOD: 15
MESG1: Place sensor on Cz Eyes Open
SITES: Cz LE GND
PERIOD: 15
MESG1: Place sensor on Cz Turn on Harmonic Test
SITES: Cz LE GND
PERIOD: 15
MESG2: End of Harmonic Test
SITES: Cz LE GND
PERIOD: 15

MESG1: Place sensor on O1 Eyes Open
SITES: O1 LE GND
PERIOD: 15
MESG2: Done with Eyes Open for now
SITES: O1 LE GND
PERIOD: 15
MESG1: Place sensor on O1 Eyes Closed

SITES: O1 LE GND
PERIOD: 15
MESG1: Place sensor on O1 Eyes Open
SITES: O1 LE GND
PERIOD: 15

MESG1: Place Sensor on F3 Eyes Closed
SITES: F3 LE GND
PERIOD: 15
SITES: F3 LE GND
PERIOD: 15
MESG2: Done with F3 for now
SITES: F3 LE GND
PERIOD: 15

MESG1: Place Sensor on F4 Eyes Closed
SITES: F4 LE GND
PERIOD: 15
SITES: F4 LE GND
PERIOD: 15
MESG2: Done with F4 for now
SITES: F4 LE GND
PERIOD: 15

MESG1: Place Sensor on Fz Eyes Closed
SITES: Fz LE GND
PERIOD: 6
SITES: Fz LE GND
PERIOD: 6
SITES: Fz LE GND
PERIOD: 6
SITES: Fz LE GND
PERIOD: 6
SITES: Fz LE GND
PERIOD: 6
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PERIOD: 6
SITES: Fz LE GND
PERIOD: 6

DONE:

10. Future Directions
The Clinical Q is a robust assessment tool. The excel spreadsheet has many capabilities. And the brain is the most complex thing there is. There are many opportunities for improving the Clinical Q on the BrainMaster in the future.

I have not discussed the treatment plan feature of the spreadsheet because Dr. Swingle is philosophically opposed to this capability and it is prone to error. This may change.

Having a flag or probe is one thing. Going to treatment protocols is another. These treatment protocols should use Dr. Swingles frequency band definitions. The treatment dictum, follow the map is vague when there are multiple targets. Experienced neurotherapists tend not to agree on exactly what to do and when with any brain map or EEG assessment data. For now and maybe forever, this is best left to the judgment of clinicians.

Dr. Swingle does all his calculations by hand. He writes in <u>Basic Neurotherapy The Clinician's Guide</u> about many other conditions that the Clinical Q can detect which are not apart of the current interpretation. He also discusses a range of therapies that are not in common use in the neurofeedback community such as sound protocols and BrainDriving.

A future direction may be to milk the data for further trends. For example there are 3 markers for fibromyalgia/chronic fatigue, and others for addictions, viral infections and predisposition to PTSD.

Artifact detection and rejection or repair are a feature for the future.