



Overview

Now that you are familiar with the basics of the iGraph™ and the iGraph™ interface, we can start exploring ways to visualize and analyze client data.

Adding a Phase Line

First, let's examine a basic tool – the **phase line** – which is used to segment our tracking data, making it easier to evaluate the impact of our therapy on our client's behavior.

A **phase line** is a vertical line drawn in a single case graph that marks the boundary between treatment phases. In Therapy-Science, a phase line is created by placing a pipe or “|” character in the data markup to create two phases. The pipe character is located on the “\” key (usually just above the enter key), so use Shift + \ to insert it.

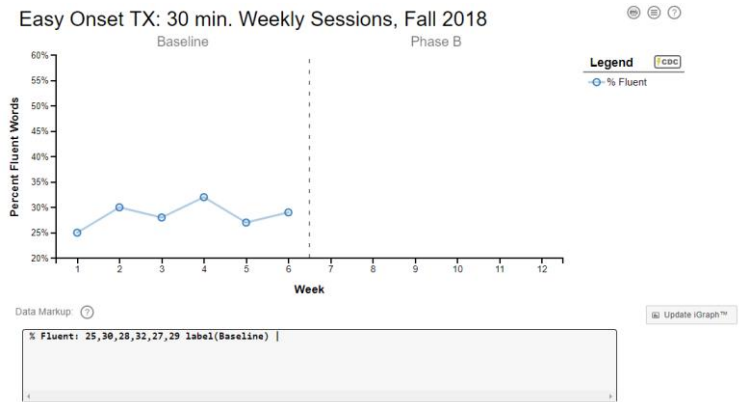
Insert phase lines when you make a change in your treatment approach (e.g., changing to a different method of teaching easy onsets), or to mark a change in circumstances (e.g., new medication schedule, change in school, new AAC device) that may impact your client's performance. You will also use a phase line to distinguish between baseline data obtained prior to active treatment (e.g., the data for JB before she began fluency therapy) and the data obtained during treatment. The insertion of a phase line visually divides the data series, making visual assessment for change easier. Phase lines are also used by iGraph™ to generate measurements, trend lines, and statistical analyses.

Let's try it out!

iGraph™ Practice 1.2.a

1. For this exercise, we'll be using our client JB to explore the use of phase lines in the data markup. Go ahead pull up your iGraph™ for **JB** and the **Easy Onset TX** treatment. You will recall that you gathered 6 data points from JB before you embarked on fluency therapy with her. You recorded her telling a 200-word story during your assessment, she then recorded herself doing the same task once each week for the next 4 weeks, and when she arrived for her first therapy session, you recorded her telling another 200-word story. So you had 6 measures of her fluency during 200-word story telling tasks prior to initiating treatment with her.

- Let's add a new phase to the graph. Add the | to the end of the data markup and press the **Update iGraph™** button on the right. Your graph should look like this:



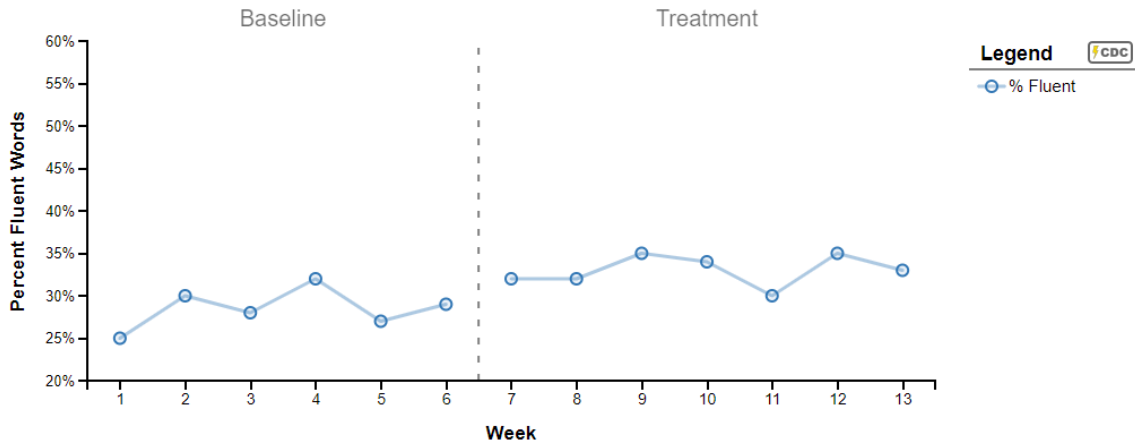
- You've now seen JB once per week for 7 weeks. You've been teaching her how to implement easy onsets to improve her fluency. Each week, you recorded her telling a 200-word story and you calculated her percent fluency. Her results are in the chart below. Add these data points to the second phase in the Data Markup box:

WEEK	PERCENT FLUENT
7	32
8	32
9	35
10	34
11	30
12	35
13	33

- Now change the label in the second phase to read "Treatment". When you are done, your iGraph™ should look like the one shown below:

NOTE: See that now that we have 13 data points the x-axis expands past the Pad x-axis to setting value of 12?

Easy Onset TX: 30 min. Weekly Sessions, Fall 2018

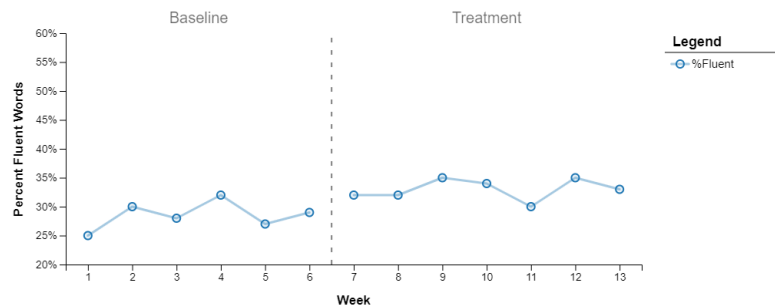
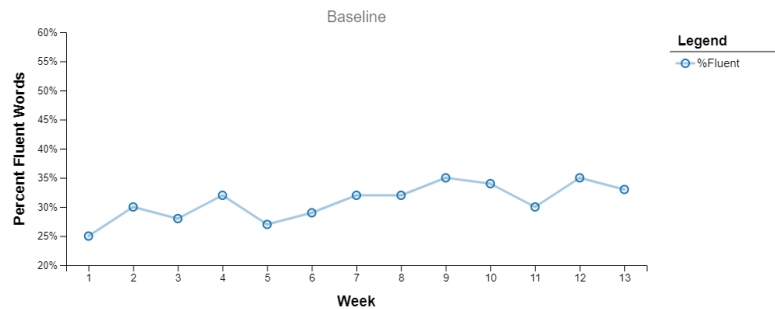


Data Markup: ?

```
% Fluent: 25,30,28,32,27,29 label(Baseline) | 32,32,35,34,30,35,33 label(Treatment)
```

Update iGraph™

- The addition of the phase line creates two data paths, making it easier to assess the difference between the baseline and treatment sessions. Insertion of a phase line alters our whole perception of the data in our graph, emphasizing difference versus continuity (assuming there is a difference). Compare these 2 versions of the same data, one with the pipe character separating the phases and one with a comma keeping the full set of 13 data points together (go ahead and replace the | with a comma in your graph to see the change yourself) :



There is gradual improvement in fluency performance over the entire data set, but are there any significant changes after week 7?

The addition of the phase line helps us to visually and (as we shall soon see) statistically analyze those differences to detect change in a way that can help us decide if the treatment we are using is having the effect that we want and expect. With the phases separated, it is easier to see that there is a small but consistent difference between baseline and treatment phases.


6. Now restore the phase line by removing the comma between the 6th and 7th data point and replacing it with the phase line | as we had before.

Data Analysis Basics: The Analysis Results Panel

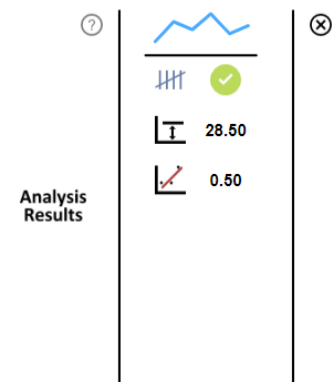
In the last module, we saw that clicking on a data path would show us the Analysis Results panel below the iGraph™. Before we dive into analyzing JB's progress, let's first explore the **Analysis Results** panel a bit so that we are familiar with some of the information that it presents.

iGraph™ Practice 1.2.b

1. Show the Analysis Results panel by clicking on the baseline data path. It should look like the image shown on the right.

The components of the Analysis Results panel are detailed in the help dialog for the panel. Click on the circle that contains the question mark  in the top left of the Analysis Results panel to bring up the dialog shown below.








You should review the information presented in the dialog, but we'll go through it section by section using JB's data next.

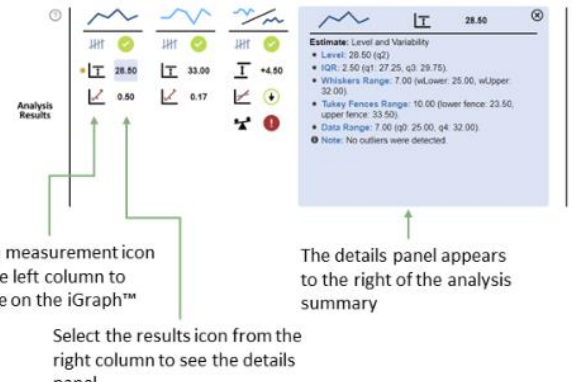


Analysis Help

Results Panel Basics

A single **data path** analysis summary contains results for these measures

-  Data Count
-  Level
-  Trend
-  Goal Analysis
-  Level Comparison
-  Trend Comparison
-  Series Comparison



Select a measurement icon from the left column to visualize on the iGraph™

Select the results icon from the right column to see the details panel

The details panel appears to the right of the analysis summary

When a **Treatment** data path is compared to a **Baseline** data path, statistical comparisons between the two are also performed

Introductory Analysis with iGraph™: Level and Trend

Now that you have graphed two phases of your client data, you can begin asking some questions about your therapy. Questions like *“How much has JB progressed since I started her treatment program?”* and *“How confident am I that her performance actually represents progress?”*, or *“When can I expect her to reach her goal?”*

It is important that you monitor progress throughout your treatment program to make sure that your client is responding as you would expect based on your treatment plan and the expected results for your chosen treatment (which is usually documented in the literature).

Analyzing your data using an iGraph™ makes it easy to extract important insights that will help you determine the answers to questions about progress. In the next few sections of this module we’ll introduce and examine some of these capabilities with the data that was collected for JB.


Refer to chapter **6.2 Measurement Basics: Level, Trend, Variability, Phase Length** for an overview of the terms **level** and **trend**. Briefly, level refers to median performance and trend refers to the slope of performance (i.e., pace and direction of change).

How much progress has there been since I started treatment?

This is an important question to try to answer. You want to be sure that your treatment is having an impact on the performance of the client. We can start by looking at the baseline data and comparing that to the data that we have for the first 7 weeks of treatment.

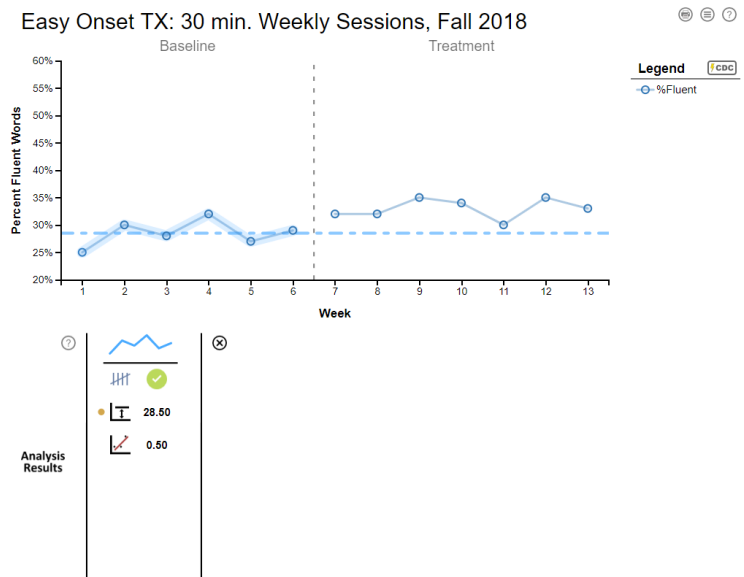
To help answer this question we can compare the **level** of the baseline data to the **level** of the treatment data.


iGraph™ Practice 1.2.c

1. Click on the baseline data path and then click on the level icon . Visually, the level of the baseline data is shown and projected across the width of the iGraph™.

In the Analysis Results window, you can find the numeric value of the level estimate (median) just to the right of the level icon – it is 28.50.

So, we know that the estimated level of the baseline phase is 28.5% fluency.

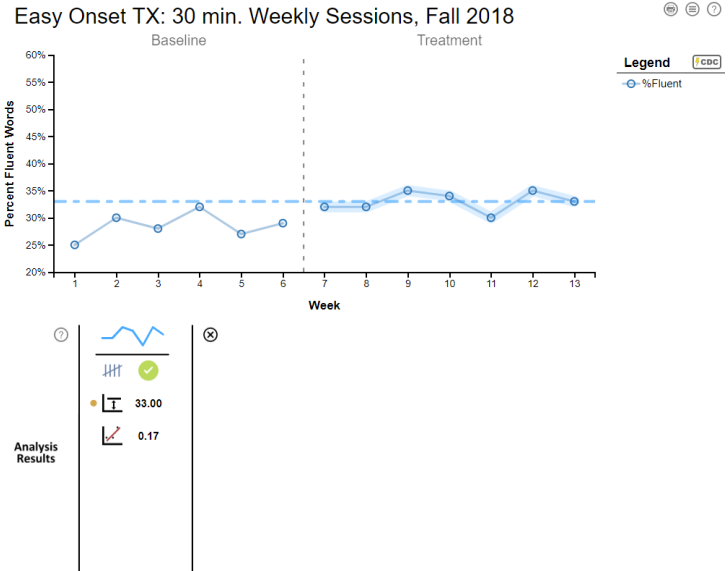


2. Next close out the **Analysis Results** panel for the baseline phase by clicking on the  button in the top-right. Now click on the 2nd phase Treatment data path to open the Analysis Results panel for the treatment phase.

Repeat the process you did for the baseline data.

You will now see the level of the treatment phase projected on the iGraph, and you will see the numeric value of the level estimate in the Analysis Results window.

Notice that the level is 33.00, so the median of the treatment phase is 33% fluency.

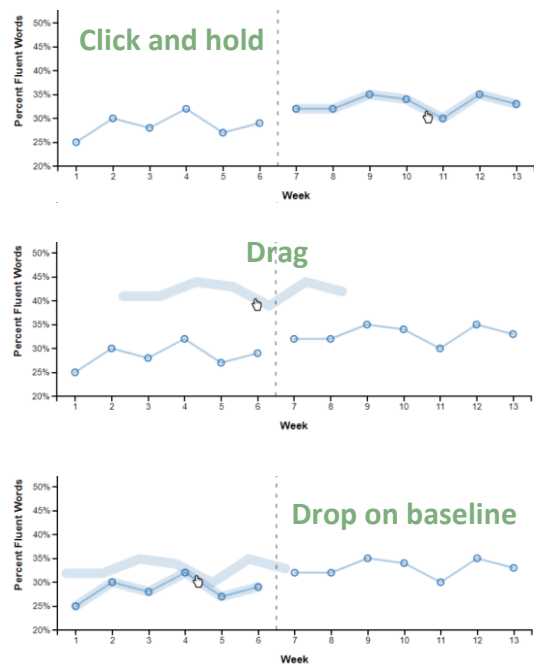


How does this compare to the baseline phase? Subtracting the baseline level from the treatment level, we can see that JB’s fluency when telling 200-word stories has improved by 4.5% since starting treatment.




– OR –

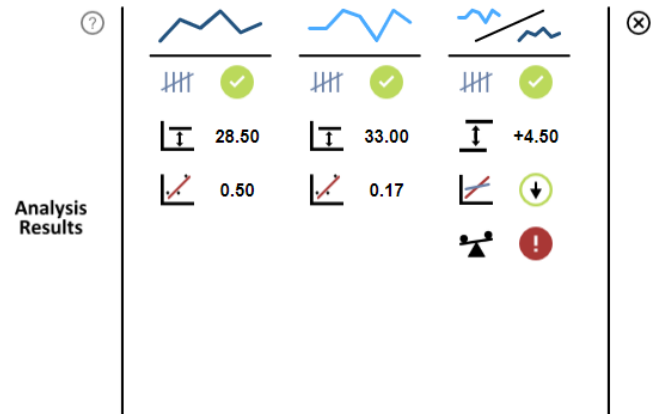
- We can let the iGraph™ do the work in steps 1 and 2 above for us by comparing the data from the two phases directly. Close out the Results panel by clicking on the ⊗ button on the top right of the panel.


To compare data paths directly, simply drag the treatment data path over to the baseline data path and when the baseline data path is highlighted, drop it.




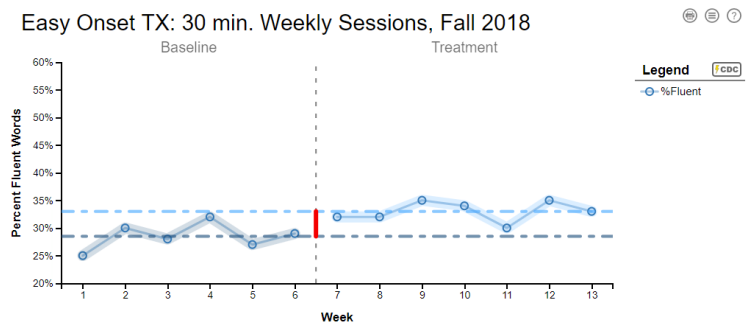
The Analysis Results panel will now open with 3 columns of data – as shown on the right.

The first column (the one under the dark blue sparkline ) is the analysis summary for the baseline data path. The second column (under the light blue sparkline ) is the analysis summary for the treatment data path. The third column (under the comparison pair of sparklines ) is the comparison results between the two.



We can see that in the third column, next to the level comparison icon , that the difference between the two is a +4.50. This means that the treatment phase is estimated to be 4.50% higher than the baseline phase (just like you calculated manually earlier).

Click on the  icon and you can see this difference visualized on the graph (as shown on the right).




It certainly looks like things have improved since the treatment phase was initiated. However, we can dig a little deeper and check. We do that by asking the next question.


Is performance moving in the right direction (i.e., improving)?


This is another important question to try to answer. We know from the level analysis that there is a difference in the median performance at baseline compared to the median performance during treatment. But it's also important to know if the client's performance is continuing to improve and at what pace.

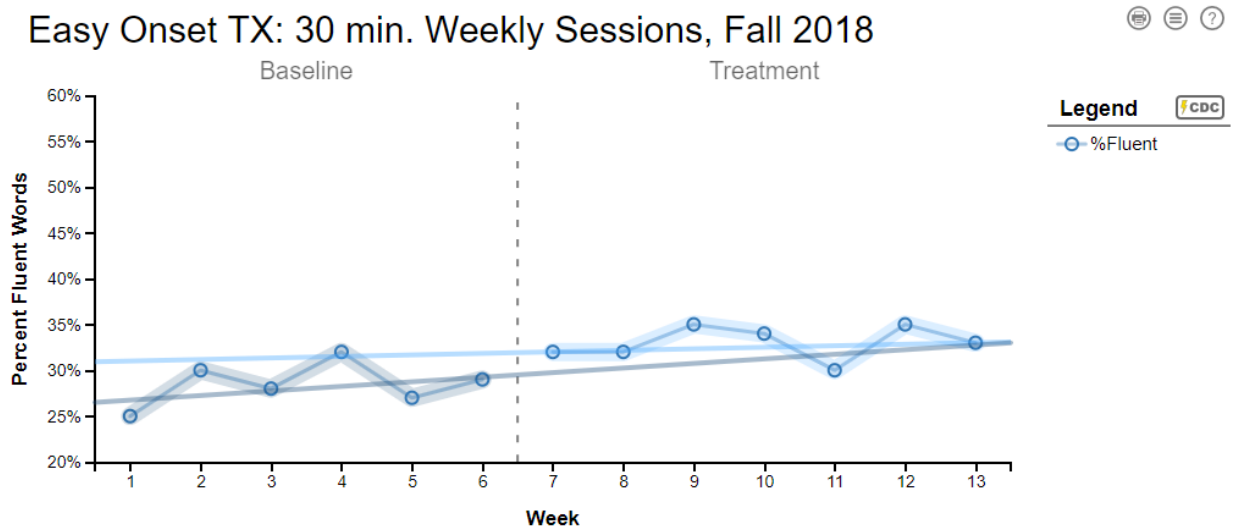
To help answer this question we can compare the **trend** of the baseline data to the trend of the treatment data.

iGraph™ Practice 1.2.d

1. If you closed the Analysis Results panel after the last section, then go ahead and drag the treatment data path and drop it on the baseline data path so we can take a look at the trend of the baseline as compared to the trend of the treatment.
2. Visually, it looks like JB was on an upward path during the baseline measures, but the trend seems to be levelling off during the treatment phase. Just below the level icon on the Analysis Results panel, there is the trend icon .

Just like level, we can see the individual trends for both the baseline and treatment phases shown next to the  icon. The baseline trend is 0.50 meaning that there is a 0.50% increase in fluency each week during the baseline measures. For the treatment phase we can see that there is a 0.17% increase in fluency each week.

We know that 0.17% is less than 0.50%, so it looks like we are slowing down the rate of improvement. Slowing down JB's improvement is not what we expected. Yikes! That can't be good. Let's click on the trend comparison icon  and see what we're dealing with. The iGraph™ will now show you both trends on the graph so we can visually compare them.



The trend is indeed decreasing (becoming more horizontal), but it's not by much. The trend is still positive (meaning JB is improving) which is good, but this is a concerning piece of information. This is exactly the kind of indicator that would cause us to reflect upon the treatment choices and make sure that any treatment plan going forward incorporates this information.

Looking at the data, there was a definite jump in performance once the treatment began, so it's probably safe to assume that the Easy Onset treatment has some positive effect – but why isn't it continuing? Perhaps the treatment choice is not effective for JB? Is JB beginning to plateau because she needs more practice to get beyond her current fluency level? Could there be other reasons that her improvement is not what we expect?

In this case, you have confidence that your treatment approach is a proven and effective one for most clients. With that in mind, you may want to consider other variables that could be impacting results. Should you increase treatment time to 1 hour each week instead of 30 minutes? Should you assign more homework or a different type of homework?

You will need to use your clinical judgement to determine which – if any – change to implement. However, before you make any drastic changes, we can explore another dimension of the data: variability. You will do that in the next module.

When can I expect my client to reach their goal?

This is an important question that helps you plan your treatment sessions and helps you communicate appropriate expectations to your clients. In JB's case, we have yet to define a specific goal. However, based on the findings from the previous section when we examined trend (i.e. JB's progress has slowed and seems to have plateaued), perhaps it is best to table this question until we can address our immediate concern: finding and executing a treatment approach that will provide a more pronounced rate of improvement.

We'll pick up this question in a future module and explore how the visualization analysis tools built into iGraph™ can help forecast client performance and provide helpful insights as to how we can answer questions about goal achievement.

Congratulations!

You have begun to explore some of the visual and quantitative tools that allow you to monitor your client's progress and assist in your therapy decisions. Adding phase lines to define phases of treatment help you to visually assess the treatment effect. Level and trend can also be integrated into your analysis to help understand your treatment outcomes and inform your decisions about future treatment plans.

Below are listed a series of How-To resources that you can use to learn more about using visual as well as the level and trend analysis to help assess the progress of your client.

Relevant How-To Resources

Additional information on some of the technical steps covered in this tutorial are covered in the following How-To articles. You can find these in the **How-To Index** that is in the **Quick Links** section of the **Resources** page.

- How-To Analyze Data I: Single Data Series
- How-To Analyze Data II: Level, Trend, and Variability