# Progress Standards of Comparison Support Paper

**Methods Used to Make Progress Comparisons (Standard of Comparison)**

**Most Rigor**

Comparison to same age peer group

Comparison to younger peers

Comparison to historical progress

Comparison to goal expectations

**Least Rigor**

At the time of the original Child Find training, five rates of progress comparison standards or methods were identified.

These methods can be ranked in terms of their preferential usage. They all require an understanding of how the individual's rate of performance will be compared to the expected performance.

Each comparison standard/ method is described and the intervention team will select one of the Progress Comparisons as their standard.

Note: While five standards or methods were originally determined as valid, the Child Find team has determined that mastery as a standard result in no mathematical calculations which are useful in terms of determining progress at an expected rate, thus it is no longer included as an option.

## Rate of Progress (ROP) for Comparison to Same Age Peers

When comparing an individual's performance to the performance of peers, at a minimum we need to know four pieces of information.

- Baseline performance for same-age peer group

- Ending performance for same-age peer group

- Baseline performance of the target individual

- Ending performance for the target individual



Comparison to Same Age Peer Group
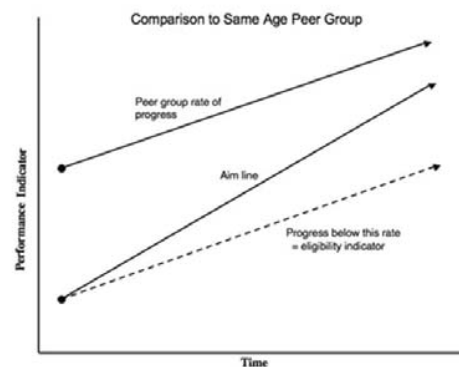
These four pieces allow us to obtain rates of progress and the slopes of the trendline that are established.

Note: This method requires drawing the growth line from the baseline peer performance at the beginning of the intervention to the peer performance at the end of the intervention. In some cases, research has established typical or expected growth rates. In other cases, regional norms can provide guidance. The peer comparison line would be set from those research standards or norms. If peer performance data over time is not available, it can be gathered by surveying the performance for 3-5 actual peers from a classroom who the teacher identifies as average students. When using this method, the peer performance line will not be drawn until the end of the intervention.

### *Calculating ROP for Comparison to Same Age Peer*

Using the beginning and ending data points, it is possible to calculate the expected rate of progress (peer) and the actual rate of progress (individual).

Peer Rate of Progress

$$\frac{\text{(Ending Performance) - (Beginning Performance)}}{\text{Time}} = \text{Peer ROP}$$

Individual Rate of Progress

$$\frac{\text{(Ending Performance) - (Beginning Performance)}}{\text{Time}} = \text{Individual ROP}$$

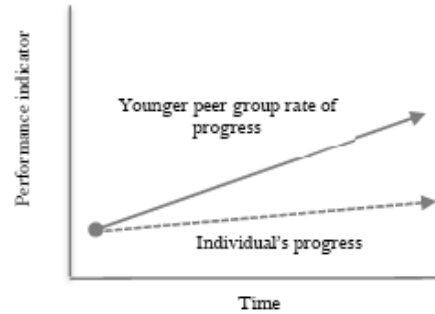## Do the Math - Comparison to Same Age Peers

If Joan is having difficulty with reading fluently and the goal is to increase her words read per minute, then her rate of progress can be calculated by knowing her growth during the intervention and knowing peer growth during the intervention. If the average peer is reading 42 words per minute at the beginning of the 10-week intervention period and reads 57 wpm at the end, then the peer has grown 1.5 words per week (wpw). If Joan started at 20 wpm and her ending performance was at 42 wpm, then she grew at a rate of 2.2 words per week (wpw).

Peer ROP $\frac{\text{57 wpm - 42 wpm}}{\text{10 weeks growth}}$ = 1.5 wpw growth    Joan ROP $\frac{\text{42 wpm - 20 wpm}}{\text{10 weeks}}$ = 2.2 wpw

# Rate of Progress (ROP) Compared to Younger Peers

There may be times when data to make peer-to-peer comparisons is not available. In these cases, peers may have already mastered a skill, but rather than use mastery monitoring (a non-preferred method of comparison) look at the acquisition of the skill in measurable increments over time-based on when the skill should have been learned. This method would probably be most applicable to Early Childhood and Speech and Language cases.

To calculate ROP compared to younger peers, data representing the younger peer group's rate of acquisition in the area of concern will be needed. The comparison slope (rate data) would come from data on the younger peer group. It can be provided through norms or by sampling the performance of a set of younger peers as they are acquiring the skill

## Calculating ROP for Comparison to Younger Aged Peers
The calculation formula is the same as the one used for same-age peers.

Younger Peer Rate of Progress

$$\frac{(\text{Ending Performance}) - (\text{Beginning Performance})}{\text{Time}} = \text{Younger Peer ROP}$$

Individual Rate of Progress

$$\frac{(\text{Ending Performance}) - (\text{Beginning Performance})}{\text{Time}} = \text{Individual ROP}$$

### Do the Math - Comparison to Younger Peers

Marcus is not using words as expected. Given his delays, the speech-language pathologist has decided to use a growth rate of typically developing peers who are younger than Marcus rather than the rate of same-age peers. Baseline data indicates Marcus is using 25 different words in his daycare setting and with his parents. Research indicates that most children increase their vocabulary from 100 to 500 words during the time between their second and third birthdays. This is a rate of about 15 words every two weeks. Given this information, a goal was set for Marcus to use 100 different words by the end of the 10-week intervention period (10/2 X 15 + 25 = 100).

Intervention data indicated at the end of the 10-week period Marcus was using 40 words collectively in the home and at daycare.

Calculations

1) Peer ROP (research standard) = 7.5 words/wk   or   15 words/2 wks

2) Marcus ROP   $\dfrac{40 \text{ (ending) words} - 25 \text{ (beginning) words}}{10 \text{ weeks of intervention}}$   = 1.5 words per week or 3 words/2wks

3) Marcus' rate of growth is only about 1/5 the rate of growth of children who are almost 2 years younger in age. This rate of growth would not be sufficient to allow the child to progress to a typical two-year-old level at this time and is suggestive that more intensive intervention is needed.

## Rate of Progress Compared to Previous Growth (Historical Performance)

If it is difficult to determine a rate of progress for a peer expectation, it is possible to compare an individual's rate of growth against his/her past growth to determine the rate of progress. In order to make this comparison, performance data in the same area of skill as the focus of the



intervention is necessary. Performance data prior to the current intervention gathered over a specified period of time to establish the historical progress line. Next, compare that to the slope of progress under the current intervention conditions.
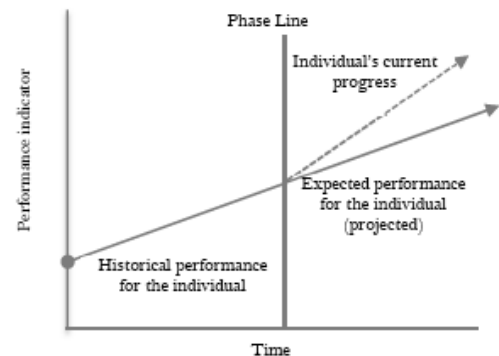
Historical data could come from performance data under the core instruction, targeted or intensive instruction, or through Part C outcome data. If a child has gone through a series of interventions, and phase changes were made, then data from a different phase period could be used to establish the historical slope. Extend this historical slope line over the course of the current intervention. Plotting the individual's new intervention data gives a comparison slope line.

Do the Math - Historical Performance ROP Example

Beth is only taking a limited amount of nourishment while being bottle-fed. Her mother has kept track for the last 5 days and the most Beth is taking at any one feeding is an average of two ounces, has increased a total of 2.5 ounces over the 5 days. She is feeding 10 times per day and her intake is now 20 ounces. Her historical rate of progress would be:

$$\frac{20 \text{ oz.} - 17.5 \text{ oz.}}{5 \text{ days}} = .5 \text{ oz/day}$$

A feeding program is being implemented with the assistance of the occupational therapist. The goal is to increase Beth's intake. Parent logs indicate Beth is taking 30 ounces at the end of the 2-week intervention. Her current rate of progress is:

$$\frac{30 \text{ oz.} - 20 \text{ oz.}}{14 \text{ days}} = .71 \text{ oz/day}$$

Examine the data gathered. The intervention that was put in place appears to be successful in terms of increasing the ounces per feeding. Additional details might be helpful when determining the significance of the intervention, however. For example, the number of feedings that occurred, the time between feedings, as well as the ounces/feeding intake, and any data about expelling fluid might be helpful in interpreting the data.

Change the Results: What if instead the data looks like this? A feeding program is being implemented with the assistance of the occupational therapist. The goal is to increase Beth's intake. Parent logs indicate Beth is taking 30 ounces at the end of the 3-week intervention. Her current rate of progress is:

$$\frac{30 \text{ oz.} - 20 \text{ oz.}}{21 \text{ days}} = .47 \text{ oz./day}$$

Now what does the data indicate? 30 ounces, after all, was an increase in intake. Was the intervention effective? How did you come to that conclusion? Does the intervention need to change? Why or why not? What additional information would be helpful to know?

The slope is an important and necessary component of the rate of progress. This is, however, only part of what the rate of progress data provides. It is helpful to also know qualitative data. One without the other leaves unanswered questions.

## Rate of Progress Comparison to Aim/Goal Line

The least preferred, but still an acceptable method of calculating the rate of progress is to compare the individual's rate of growth during intervention with the goal or aim line established at the time of intervention planning. One reason this is lower on the rigor level is that it is not truly a standards-based approach; progress will be compared to an estimate

or assumed rate of growth set by practitioners, rather than actual expected performance data.

On the surface there is no way of telling if the goal was set too high, too low, or just right. For analysis using this method, we need to know whether or not the goal or ending point established for the individual was appropriate – instruction was matched, implementation integrity was in place, it was a SMART goal, etc. If those things were put in place, then you can make a more confident decision about the individual's rate of progress compared to the goal expectation.



Comparison to Individual's Aim Line
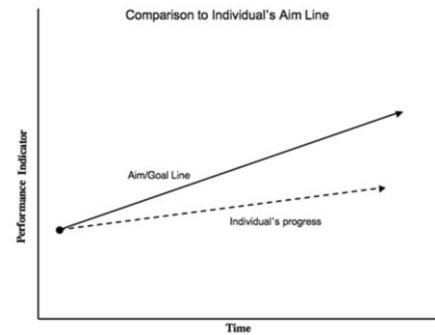
Note: When is it appropriate to use this method of the rate of progress comparison? If there are no performance standards available, no peer comparison data available, no historical data available, etc., this method may be used. Too often, however, this is the chosen method of determining a goal and subsequent progress conclusions.

### *Calculating ROP for Comparison to Aim/Goal Line*
The calculation formula is the same math equation as before; however, the results are compared to an estimated growth rate.

Aim Line Rate of Progress

$$\frac{(\text{Ending Expectation}) - (\text{Beginning Performance})}{\text{Length of Intervention}} = \text{Aim Line ROP}$$

Individual Rate of Progress

$$\frac{(\text{Ending Performance}) - (\text{Beginning Performance})}{\text{Length of Intervention}} = \text{Individual ROP}$$

Do the Math - Comparison to Aim Line

Sylvia is struggling to answer factual comprehension questions taken from a 3rd-grade level reading text. At the beginning of an intervention, she was unable to independently answer any comprehension questions correctly at the 3rd-grade level. The teacher expects that her third-grade students will be able to answer 100% of the factual comprehension questions presented to her class (5/5 questions). The team set a goal that Sylvia would answer 4 out of 5 factual comprehension questions using third-grade level materials on three successive trials, by the end of a 9-week intervention. By the end of the intervention Sylvia was able to correctly answer 4 factual questions.

1) Aim line calculation - 5 (expectation) correct factual responses - 0 (beginning)

$$\frac{5 \text{ (expectation) correct factual responses} - 0 \text{ (beginning)}}{9 \text{ weeks}} = \text{about } .56 \text{ correct answers per week}$$

Note: When doing the math, there are times when the ROP calculation requires you to think mathematically not logically. With comprehension questions, the answer is either right or wrong; so, you would not think in terms of portions of an answer. The rate of progress calculation here is to approximate the growth rate.

2) Sylvia's ROP - $\frac{4 - 0}{9}$ = .44 correct answers per week

3) Sylvia did meet her goal and improved in comprehension by 4 total questions, (representing growth of just less than 1 question every two weeks). Her rate of progress was consistent with the expected rate and the intervention used could be continued in a typical general education environment to see if progress continues to be seen with increasingly complex questions.