Aggression Replacement Training (ART)
Expected change calculations

The Positive or Expected change calculations in the ART outcomes data collection tool are based on a relative change index or RCI. Youth are not counted as having met a significant level of change unless they are both in the expected or anticipated direction and pass the threshold of the RCI.

The RCI is based on the idea that there is a normal amount of fluctuation in how people respond to questions. On one day, a youth might respond "somewhat agree" to a question, and on the next day they might respond "really agree", however, this change in response does not necessarily indicate that they youth's attitude or behaviors have changed. It may be that this change in response really has more to do with mood, something that happened earlier in the day, or even interpreting the question differently. We can call this "circumstantial change" – change based on temporary circumstances. When measuring change, we want to be sure that we are measuring actual change in youth attitudes, beliefs, and behaviors, not changes in moods and situations.

The RCI helps us to sift out actual change from circumstantial change by taking into account how much youth in your programs fluctuate in their answers of questions. These fluctuations have a standard range and the RCI measures if change from pre-test to post-test is *beyond the standard range of fluctuation*.

The calculation of the RCI takes into account how accurate, or reliable, the survey instrument is, and how likely we would be, by chance, to find change outside of that standard fluctuation. It also takes into account that there is a certain amount of imprecision in our measurement of fluctuation. Based on all of these factors, the formula for RCI helps us to understand whether change in youth responses is truly the change we are trying to create and measure.

What is the RCI calculation based on?
The RCI is calculated using the pre-test scores for the specific group of youth who will participate in the ART curriculum together. A standard deviation (e.g., fluctuation) is calculated on the raw pre-test scores associated with a particular construct or grouping of questions. This standard deviation is then used in conjunction with an alpha score (e.g., survey reliability) to determine the standard error of difference (SEdiff, e.g., accounts for imprecision). The SEdiff is then multiplied by a standard score (Z score, e.g., the level we set for identifying whether this change would be found "by chance") for the survey tool to obtain and RCI for that construct.

If you would like more details on the specific formula of the RCI, please contact the EPISCenter. The formula is based on the following research article on measuring significant change in individuals: Evans, Margison, & Barkham (1998). The contribution of reliable and clinically significant change methods to evidence-based mental health. *Evidence-Based Mental Health (1) 3, p.70-72.*