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Intermediate Milestone #2.

My plan for the second milestone is to discuss the research methods I plan to utilize in this study and present some preliminary results. Due to the very nature of the single subject study design, most statistical research methods cannot be used to generate meaningful results. However, there are established practices for single subject reporting in the behavior analysis community, specifically in the field of Applied Behavior Analysis (ABA).

In order for the study of behavior to be considered meaningful by ABA standards, it must meet certain criteria. First and foremost, the behavior being tracked must be measurable, which means that it has four distinct features:

- Countability: behavior can be counted
- Repeatability: behavior is repeated
- Temporal Extent: behavior has a specified duration
- Temporal Locus: behavior has a distinct start and end time (Bailey & Burch, 2002, p. 36)

In some cases, counting the number of times the behavior occurs may not be sufficient. Researchers then use the rate of behavior or frequency (F), which is the number of times a behavior occurs in a given observation period (Sarafino, 2012, p. 42). This is particularly helpful in skill development, which the latter part of our research will concentrate on.

Another useful approach is to measure celeration (C), which is the change in the rate of responding per unit of time (Sarafino, 2012, p. 43). It is typically reported using the Standard Celeration Chart, an example of which can be found below:
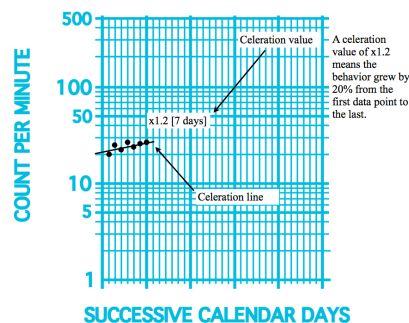

Figure 1. Standard Celeration Chart (N. D.)

If you recall, the original study proposal (Litvak, 2017, February 26) had to be amended due to the non-compliance of the subject. The amended proposal included a week of peer-to-peer tutoring (PTPT) sessions on using the application Uchubuka (Litvak, 2017, March 18). During that time non-compliance was tracked. An incident of non-compliance (NC) was defined as either:

- Turning off the application
- Walking away from the application
- Repeatedly hitting the iPad

These three behaviors meet the criteria set forth by ABA standards, in that

- The behaviors can be counted
- The behaviors occured repeatedly
- The behaviors exhibit Temporal Extent
- The behaviors exhibit Temporal Locus

The amended proposal was centered on the hypothesis that the rate of NC will decrease with seven treatment sessions in the form of PTPT. A baseline rate of NC was established and NC was tracked during each PTPT treatment session. Finally, NC was measured in a session with PTPT removed to determine if progress was made. The results were processed in Excel and the resulting Standard Celeration Graph is presented below:
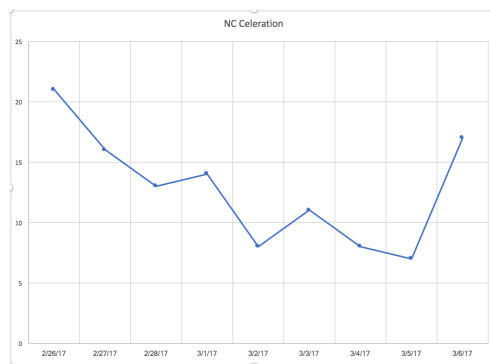

Figure 2. NC Standard Celeration Chart

As you can see, there was a fairly steady decrease in the frequency of NC across the PTPT treatment sessions, with a spike in the final session during which no treatment was administered. This is a common phenomenon known as an extinction spike, which occurs when the reinforcing stimulus is removed. It is thus expected that the NC rate will drop down to manageable levels of under 10 instances per session over the next few weeks.

This paper demonstrates that there are proven scientific methods designed to report results for single participant studies. As the study progresses the Standard Celeration Chart will also be utilized to determine whether the treatment of application use (AU) improves phonological awareness (PA) and letter recognition (LR) in the subject.

References.

Bailey, J. S., & Burch, M. S. (2002) *Research Methods in Applied Behavior Analysis.* New Delhi, India: Sage Publishing.

Litvak, Y. (2017, February 26) Study Proposal. *Unpublished. Retrieved from https://drive.google.com/file/d/0BxH2-Sze038bcGtqWlJ5U2lPYTA/view*

Litvak, Y. (2017, March 18) Intermediate Milestone #1. *Unpublished. Retrieved from https://drive.google.com/file/d/0BxH2-Sze038bUjNSVHU5MXVjLW8/view*

Sarafino, E. P. (2012) *Applied Behavior Analysis: Principles and Procedures in Behavior Modification.* Danvers, MA: John Wiley & Sons.

Standard Celeration Chart (N. D.) *Retrieved from http://theprecisionteachingbook.com/wp-content/uploads/2014/01/celeration-example.002.jpg*