Implementation of Frequency Building and Precision Teaching to Teach Sight Words via Synchronous Learning: A Case Study

Christopher J. Dietrich1 · Anita Li2

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Abstract
Frequency building, a method of instruction by which learners perform timed repetitions of the behavior followed by corrective feedback, is often used in conjunction with precision teaching wherein individuals’ performances are continuously measured on a standard celeration chart (SCC) to facilitate data-based decisions. The present case study utilized a synchronous teaching method to teach caregivers to implement frequency building in-home to teach young learners to identify sight words while learner performance was measured on a SCC. Four participants, with little previous exposure to sight words, were taught using precision teaching as implemented by caregivers. Results indicate that synchronous teaching is a viable method to teach caregivers to implement precision teaching, but care should be given to the method of teaching as well as procedural fidelity during precision teaching trials.

Keywords frequency building · precision teaching · standard celeration chart · synchronous learning · sight words

Frequency building is an educational technology involving short, repeated, timed trials of behaviors followed by immediate corrective feedback (Kubina & Yurich, 2012). Frequency building as a technology of learning developed as a component of precision teaching (PT). Precision teaching is a decision-making system wherein an individual learner’s performance is continuously measured and graphed on a standardized chart (a standard celeration chart or SCC), which aids in decision making (Evans et al., 2021). Using this system, a variety of skills can be taught in a method that is tailored to the individual learner (Lindsley, 1992).

Precision teaching as a system was developed by Ogden Lindsay in the 1960s, using frequency of a behavior as the primary datum upon which to base decisions (Johnson & Street, 2014). To aid in decision making while utilizing PT, Lindsley developed the SCC and a new mathematical measure, celeration, which is the measure of the frequency of behavior over time (Lindsley, 1971). These two tools combined allow the instructor to determine the rate of acquisition of the behavior to be taught and plot the next step or pinpoint in learning. In determining pinpoints, instructors chart the learner’s performance each day on a SCC, marking the rate of correct responses along with the rate of incorrect responses. Celeration is calculated as the frequency (occurrence per unit of time) of correct or incorrect responses per an additional unit of time, termed the celeration period, which is typically 7 days. The celeration value allows instructors to visualize the learner’s rate of growth and to set goals within that projected rate (Pennypacker et al., 2003).

Beck and Clement (1979) performed the first large-scale study of the effectiveness of PT involving elementary and secondary students, as well as students with some minor disabilities. This study is notable for using control group comparisons in which students in 1st, 2nd, 3rd, and 4th-grade students who received PT interventions were compared to 4th-grade counterparts who received standard educational interventions (Beck & Clement, 1991). Students who received PT outperformed their counterparts in the areas of reading, spelling, and math. Likewise, Johnson and Layng (1992) conducted an 11-year study of mean standardized test score gains of students who received PT along with a wide array of empirically validated curriculum and instructional methods. Students gained an average of 2.5 years of growth in reading
for each year of PT instruction and gained an average of 3 years of growth in mathematics per year of PT instruction.

More specific studies have demonstrated applicability in building reading repertoires in early learners. Morell et al. (1995) utilized PT to teach sight-word reading in elementary school children. This is of particular significance because it is a skill many schools teach in their preliminary reading curriculum (Miles et al., 2018). In the study by Morell et al. (1995), three 2nd-grade students diagnosed as learning disabled were taught component skills of beginning sounds and vowel-consonant and consonant-vowel-consonant words via direct instruction. After this phase, students were presented with a deck of 10 cards containing sight words and timed for 1-min intervals as they read the cards. Participants not only all increased their celeration values by x3.0, x1.2, and x1.1, respectively, but participants showed increased enthusiasm for practice with sight words (Morrell et al., 1995).

Since the outbreak of SARS-CoV-2, much of the United States and other parts of the world have taken measures to slow the spread of the virus, resulting in school closures which have affected “55.1 million students in 124,000 US public and private schools” (Peele & Riser-Kositsky, 2020). As more students make the transition to asynchronous learning settings, both the need and feasibility of using a learning technology that can be individually tailored to the student’s progress have become more salient.

The rise in distance learning utilization by many school students represents a unique opportunity for proponents of PT. Because PT is necessarily student-guided (Lindsay, 1971), the widespread implementation of distance learning of either synchronous (i.e., live instruction) or asynchronous (i.e., prerecorded instruction) models could benefit from the implementation of PT as a component of instruction with frequency building being the primary instructional technology utilized. Although many synchronous and computer-aided instruction methods have been utilized as supplemental instruction for young children (Kreskey, 2013; Layng et al., 2004), distance learning has itself been sparsely utilized with precollege learners, although its implementation has slowly grown as an alternative to in-person instruction (Coy, 2014). These results indicate that, although distance learning models offer an enticing alternative to in-person instruction, there is need for evaluations of efficacy. Likewise, frequency building trials that aim to increase fluency of previously learned but not yet mastered concepts could be an effective addition to distance learning models.

Sight word acquisition is currently a goal in the Common Core educational standards for kindergarten, which have been implemented by most states (Common Core State Standards Initiative, 2020). In addition, although most reading acquisition programs benefit from a focus on phonics (Ehri, 2020), English has a modest list of irregular words that do not follow normal rules of phonics. Most sight-word lists are composed of these irregular words, which must be memorized in order to be learned, as well as an additional list of words that, although they can be spelled phonetically, are taught as sight words because they are the most common words presented in early reading texts (Kear & Gladhart, 1983). As such, sight-word acquisition is a necessary component of any reading program, regardless of any learning deficit the individual may, or may not, have.

One of the primary barriers to teaching sight words (as opposed to phonics) is that using traditional methods of teaching by nontimed flashcard presentation or by reciting the spelling of irregular words can be labor intensive (Murray et al., 2019). A typical presentation of sight words might involve presenting cards to learners, asking them to try to say the word or sound it out, and not moving on until the word has been correctly spoken. This can increase the duration of the practice sessions and potentially create an aversive learning experience for young learners. Contrary to this method, frequency building represents a nonintensive (timings may be as short or long as is necessary) method that has been demonstrated effective at increasing fluency (Johnson & Street, 2014). During frequency-building trials, learners are presented with a rapid succession of cards, and errors are reviewed at the end of the trial. This applicability to sight word acquisition offers a unique benefit. This, coupled with the current emphasis on distance learning enacted by many school systems as a result of SARS-CoV-2, requires a novel method of teaching sight words that is effective, easy to implement, and can be performed while maintaining social distancing. Thus, the aim of the present case study is to investigate the effects of using synchronous learning methods to instruct caregivers to use precision teaching with children who have had little or no experience with sight words.

**Method**

**Participants**

Participants were four neurotypical children, all aged 5 years old, and their caregivers. Three participants were white, and the fourth (Sam) was mixed white and Egyptian. All participants lived with both biological parents. All caregivers reported themselves to be middle-income, employed, and married. Participants were selected among those whose caregivers responded to social media posts requesting participants in a study to teach sight words. Although all participants had been exposed to simple words presented when being read books by their parents, James, Sam, and Sarah had had no experience being taught to say sight words, and Albert had had minimal experience by being presented handwritten sight words by his mother and asked to repeat them.
James, Sam, and Sarah were attending pre-kindergarten school during the study via synchronous learning, whereas Albert did not attend school throughout the duration of the study. Midway through the study James, Sam, and Sarah made a transition to an in-person kindergarten. The caregivers were Mary (Albert’s mother), Laura (James’s mother), Carla (Sam’s mother) and Joanne (Sarah’s mother). None of the caregivers had had experience with frequency building or PT prior to training. One caregiver, Mary, was employed as a high-school teacher with a specialization in English; all other caregivers were employed in fields outside education. The highest level of education for Mary, Laura, and Joanne was a bachelor’s degree, whereas Carla held a master’s degree.

Materials

All participants received identical sight-word cards, containing 98 words on the Dolch sight-word list, which is commonly used by many school programs (Yaw et al., 2011). These cards were commercially printed on 3” by 5.87” card stock, laminated on both sides. One side of the card presented the target word printed in large type in lowercase, whereas the other side displayed a sentence containing the target word underlined (the sentence side was not used in the current study).

Dependent Variable

The dependent variable of the present study was the rate of correct and incorrect responses. Data of rates of correct and incorrect responses was collected by caregivers as following each trial, and the daily total frequency of correct response, incorrect responses, and duration of trials were graphed on a standard celeration chart.

Independent Variable

The present study involved a single independent variable. Following the baseline phase, in which reinforcement was delivered to the participant independent of performance, goals were set by the primary researcher based on participants’ current level of performance and the celeration needed to achieve a terminal goal of 60 words per minute. Trials that did not achieve the goal of correct responses did not result in access to a reinforcer following the implementation of goal setting.

Experimental Design

The study used a multiple baseline design across participants. After caregiver training, all participants began with the same list of words. Each participant was given a set of 23 words to read, with additional sets of 5 words to add in as they gain fluency, up to a total of 98 words in the terminal deck. Words were added in if the participant had a frequency-building trial with zero incorrect words or if they completed their trial with five or fewer cards remaining to be presented. Participants were given “practice trials” of untimed review of newly added words before these words were added to the stack of cards used in frequency building trials.

Caregiver Training

All caregivers received the same training protocol during the first week of the study. A 7-min-long video recording of a training session was provided to the participants. In addition, participants were given a detailed written training manual on how to record and implement frequency building trials and how to enter data on a supplied datasheet. After participants were given the video and training manual, they were instructed to watch the video, read the instructions, and then practice on their own for several days. After this, the first author conducted synchronous training sessions over Zoom using behavioral skills training that entailed reviewing the procedures, showing the video model while explaining each part of the procedure to the caregivers, then asking the caregivers to run a frequency building trial with the first author as a learner. The study did not proceed until all caregivers achieved 100% procedural fidelity in training. All caregivers completed training within 1 week. Caregivers had a minimum of 4 days to review training materials and the supplied model video. During training sessions with the primary researcher on Zoom, the average number of trials to meet 100% procedural fidelity was two. Following initial training, the primary researcher met with caregivers weekly to provide additional instruction and feedback while caregivers implemented frequency building trials.

Baseline

After initial caregiver training, participants were initially exposed to sight words by caregivers reviewing the initial 23 cards by presenting each card to the participants, modeling the correct vocalization of the word, and then having the participant repeat the word correctly before moving on to the next card. If the participant repeated the word incorrectly, the caregiver modeled the correct response before asking the participant to try again. This initial presentation of sight words prior to frequency building trials was utilized only for newly added words. After any new cards were reviewed, caregivers set a timer for 1 min, shuffled the stack of cards, and presented them to the participant until the timer ran out. Due to the participants’ ages, it was determined that caregivers, rather than participants, would manipulate each card to increase the rate of presentation. Caregivers were
instructed not to provide feedback for incorrect words spoken and to simply continue to present words until the minute ran out. After this, the caregivers informed the participants how many words they got correct and incorrect and reviewed the incorrect words in the same manner as when reviewing all words prior to the trial. Caregivers were asked to run frequency building trials minimally once per day, with a recommended frequency of five per day. Baseline continued for all participants until they exhibited 5 days of a celeration below X1.2 and a total bounce of less than X3.00, based upon recommendations from Kubina and Yurich (2012). All frequency building trials occurred at the participants’ home with the caregivers running all trials.

**Intervention**

During the intervention phase, all procedures remain the same, with the exception of an introduction of a daily goal that the participant must achieve in order to earn a reinforcer. Participants were given an array of possible reinforcers (chosen by the caregiver) and allowed to select one prior to engaging in the frequency building trial. Trials in this phase that did not meet the specified goal would not result in access to a reinforcer; participants would be given the option of trying again to earn their reinforcer or to take a break. Participants’ progress was graphed on an Excel version of the SCC (Harder, 2020), and goals were determined by calculating the celeration necessary to achieve a benchmark of 60 words per minute within 3 months. The primary researcher determined this goal and communicated it to each caregiver, with changes in the goal being relayed during weekly meetings based upon each individual’s performance. This goal was chosen because it is slightly above the 60th percentile of performance for 1st-grade students, as measured by Hasbrouk and Tindal (2006). Goals were set on a weekly basis by examining the current level of performance and increased or decreased as necessary. Caregivers were provided graphical progress of their child’s performance with the rate of correct and incorrect responses in addition to percent correct.

**Procedures**

Frequency building trials were conducted at least once per day by caregivers. Before trials, participants were given a list of appropriate reinforcers to choose from. All participants began with a set of the same 23 words. Participants were instructed to say the word out loud as quickly as they can, or to say “skip” if they are unable to. Caregivers placed correctly spoken words in a pile to the right and incorrectly or skipped words in a pile to the left. After 1 min had elapsed, the caregiver counted the number of correct and incorrect responses and recorded this on a data sheet. If the participant met the specified goal for that frequency building trial, they earned the chosen reinforcer.

**Data Entry**

Data was entered on a specific datasheet. The sheet had options for multiple trials per day, and columns allowing the caregiver to list the trial number, number correct for that trial, and number incorrect for that trial. After the trials were completed for the day, participants filled out a Google Form, which was sent directly to the primary researcher. These data were transferred to an Excel Template for the SCC, where primary data analysis occurred (Harder, 2020).

**Procedural Fidelity**

Procedural fidelity was assessed during weekly meetings with the caregiver. During these meetings, the caregiver ran one frequency building trial that the primary researcher observed. Procedural fidelity was assessed on a separate score sheet. Any time a caregiver missed any step listed in the procedural fidelity checklist, booster training occurred, followed by a practice trial of the caregiver running a trial with the primary researcher as the participant to reassess procedural fidelity. Procedural fidelity results are summarized in Figure 1. After initial training, all caregivers implemented PT procedures with 90% or above procedural fidelity during follow-up assessments, with one exception. One caregiver performed one trial with 60% procedural fidelity; this was followed by booster training in PT procedures and saw a return to 100% procedural fidelity at the next follow-up session.

**Results**

Standard celeration charts for all participants are represented by Figure 2. The SCC used in this study is what is known as the daily count per minute (DCPM) chart, which covers a duration of 140 days and can chart frequencies as high as 1,000 per day, or as low as 0.0007 per day (Pennypacker et al., 2003). Although the scale on the SCC’s x-axis is linear as with an equal interval line graph, the scale on the y-axis is logarithmic, multiplying by 10 at each major tick mark. This allows for relative changes in rate to be assessed more accurately while being standardized in a way that all charts follow the same conventions.

Correct sight words are represented on the SCC as black dots whereas incorrect sight words are represented as Xs. Celeration values are calculated for baseline and intervention phases for both correct and incorrect sight words. Each celeration value is reported with either an “X” denoting an increasing celeration, or a “÷” denoting a
decreasing celeration. Following the celeration value is the total bounce value denoted by a “b.” Bounce is a measure of the variability observed within the behavior. The duration of each phase in days is listed following the bounce value in brackets.

Visually the celeration line is represented by a solid trend line across the data, whereas bounce envelopes (which represent the range of variability observed within the data) are represented with dashed lines above and below the celeration lines. Celeration and bounce lines were graphed using linear regression, based on recommendations from Koenig (1972) and Pennypacker et al. (2003). The long dashes on the graph (typically found below the data) represent the record floor whereas the short dashes represent the record ceiling. The record floor represents the total duration of trials that occurred per each day, which are measured on the right axis. Because this study only used frequency building trials with a duration of 1 min, the record floor can also be used to show the number of trials which occurred each day. The record ceiling represents the total number of learning opportunities that occurred each day and is calculated by adding the number of correct responses to the number of incorrect responses.

For all participants except for James, an initial high celeration was observed as participants were exposed to sight words, which was followed by a steady state of responding. Baseline celerations were calculated once these steady states occurred. Table 1 displays the celerations for correct and incorrect sight words during both baseline and intervention phases. Celerations for incorrect responding were equally split, with James’s and Sam’s showing an increasing trend in incorrect sight words, whereas Albert’s and Sarah’s showed decreasing celerations.

Accuracy improvement measures (AIM) are used as a quantifiable measure of learning across time and were calculated by comparing the celerations for each participant’s rate of correct and incorrect responding, with an X denoting an improving AIM and a ÷ denoting a worsening AIM (Kubina & Yurich, 2012). AIMs for the baseline phase were split, with James’s and Sam’s showing a deteriorating accuracy, whereas Albert’s and Sarah’s showing an increase (Table 2).

James’s initial celeration during the baseline phase showed a worsening trend. The goal-setting intervention began on day 9 for James, day 14 for Albert, day 19 for Sarah, and day 22 for Sam. For the intervention phase, all participants showed increasing overall celerations paired with decreasing celerations for incorrect words (Table 1). For correct sight words, celerations ranged from X1.12 [53 days] to X1.01 [62 days], whereas celerations for incorrect sight words ranged from ÷1.21 [53 days] to ÷1.01 [62 days]. AIMs for the intervention phase all showed increasing trends.

Frequency multipliers are used to compare the immediate change between the last frequency score in the baseline phase and the first frequency score point in the intervention phase, with improving frequencies denoted by an X and worsening frequencies denoted by a ÷ (Kubina & Yurich, 2012). For correct responding, frequency multipliers were split between baseline and treatment phase, with increasing multipliers for James and Albert and decreasing multipliers for Sarah and Sam (Table 2). Incorrect responding showed increasing frequency multipliers (indicating a worsening condition) for James, Albert, and Sarah, while showing a decreasing multiplier (an improving condition) for Sam.

Celeration multipliers (Table 2) were used to compare the change in celeration between two phases and were
also calculated between baseline and intervention phases (Kubina & Yurich, 2012). Celeration multipliers for correct responding were split; James and Sam showed increasing multipliers whereas Albert and Sarah showed decreasing celeration multipliers. Celeration multipliers for incorrect responding were also split, with James and Sam showing increasing multipliers (indicative of a worsening condition) whereas Albert and Sarah showed decreasing multipliers (indicative of an improving condition). Final maximum frequencies for correct sight words per minute were 11 per minute for James, 64 per minute for Albert, 58 per minute for Sam, and 40 per minute for Sarah.

**Discussion**

This case study sought to explore the viability of using synchronous learning to teach caregivers to implement frequency building as a method to teach sight word acquisition in young children. Although socially acceptability was not formally assessed within the present study, at the conclusion of the study all caregivers were interviewed and expressed satisfaction with the procedure. Within the present study, goal setting combined with frequency building trials resulted in performance improvements in all participants; two participants were able to achieve final rates of correctly identified sight words near or above the established criterion (58 for Sam and 64 for Albert) whereas both of the other
participants were able to demonstrate growth in both accuracy and rate. Procedural fidelity (Figure 1) remained high for all participants during all assessments with one exception of Carla scoring below 60% during 1 week; however after follow-up training, her scores increased to previous levels.

When measuring performance on a SCC, a celeration value less than 1.2 is considered to be a result of practice effects (Kubina & Yurich, 2012) rather than a function of any intervention. During the intervention phase, all participants were able to achieve multiple segments with celerations greater than X 1.2; this indicates that the intervention of goal setting and reinforcement contingent upon achieving the goal resulted in a significant increase in celeration greater than what would be expected from mere practice effects (Kubina & Yurich, 2012).

Bounce envelopes on a SCC represent a measure of the variability observed within the data. Data which occur outside of the bounce envelopes are considered to be outliers, with data points above the bounce envelope labeled as highliers and data points below the bounce envelope labeled as...
A high number of outliers in correct and incorrect responses were observed in the intervention phase for all participants. Lowliers in correct responses and highliers in incorrect responses were typically observed to follow the introduction of new words into the deck of available cards, and after several days with these new cards rates of correct and incorrect responses were typically observed to occur within the bounce envelope.

Kubina and Yurich (2012) discuss the use of the AIM in evaluating the change in accuracy over time. A ratio of celerations for correct and incorrect responses is created, with the resulting ratio communicating an increase or decrease in accuracy over time, with an “X” denoting an increase in accuracy whereas a “÷” denotes a decrease. Like celeration values, AIMS are multiplicative; thus, an AIM value denotes that accuracy was multiplied or divided by the value over the given period. AIM measures for all participants showed an increase in accuracy during the intervention phase. Kubina and Yurich (2012) list AIM values that correspond to significance in accuracy improvement. Using these values, James and Albert’s
### Table 1

| Participants | Baseline |  | AIM |  | Intervention |  |
|--------------|----------|---|----|---|--------------|---|
|              | Corrects | Incorrects |       | Corrects | Incorrects |       |
| James        | ±1.32    | X1.21      | ±1.60 | X1.11    | ±1.15       | X1.28 |
|              | [9 days] | [9 days]   | [9 days] | [70 days] | [70 days] | [70 days] |
| Albert       | X1.34    | ±3.75      | X5.02 | X1.13    | ±1.11       | X1.24 |
|              | [5 days] | [5 days]   | [5 days] | [54 days] | [54 days] | [54 days] |
| Sarah        | X1.30    | ±1.52      | X2.07 | X1.01    | ±1.01       | X1.02 |
|              | [9 days] | [9 days]   | [9 days] | [62 days] | [62 days] | [62 days] |
| Sam          | ±1.00    | X1.08      | ±1.08 | X1.12    | ±1.21       | X1.36 |
|              | [15 days]| [15 days]  | [15 days] | [53 days] | [53 days] | [53 days] |
results indicate a small accuracy improvement, whereas only Sam’s results indicate adequate accuracy improvement. Sarah’s data indicates no significant change in accuracy compared to baseline. Although accuracy improved for all participants, the relative low level of significant accuracy improvements for all but one participant indicates that an experimental effect was not demonstrated with the present study.

Likewise, although each participant demonstrated single celeration segments that were considered indicative of effective learning (Kubina & Yurich, 2012), the between phase analysis fails to demonstrate the effectiveness of goal setting as an intervention to increase rates of correct responding. Kubina and Yurich (2012) describe methods for comparing the learning between one phase of a PT program and another. One such measure is the celeration multiplier, which measures the change in celerations between phases. Examining the participants’ celeration multipliers, it was apparent that only James and Sam showed overall improvements between phases, whereas Albert and Sarah showed decreased celerations between phases. One caveat in using the celeration multiplier in this method is that it compares the celerations across phases rather than the separate celeration values within those phases. Lindsley (1971, 1991), as well as Johnson and Street (2014) describe learning as elastic rather than static. In other words, it is not the total quantity of words an individual can read that represents learning, but rather the change levels of fluency over time, as measured by celeration. As such, PT is designed to make within-phase decisions and implement immediate changes. Thus, although the overall differences between the baseline phase and intervention phases were less impressive, both increases and decreases in learning were observed, measured, and altered within the treatment phase.

Sarah initially demonstrated strong growth in both rates of correct responding and accuracy; however, due to frequent vacations during which no frequency building trials were run, her rate of responding began to decrease. Sarah’s caregiver was able to reintroduce regular trials; however, the family elected to end participation in the study due to family commitments and their children entering school.

Based on visual analysis of rates of responding, James’s data show the least improvement. After an initial low rate of responding during baseline, James’s responding during the intervention phase resulted in low, even decreasing celerations over time. During weekly meetings with James’s caregiver, two possible explanations for this were identified. Whereas Albert, Sarah, and Sam typically conducted between three to nine frequency building trials each day, James’s trials were only run once or twice each day. Although this may not necessarily have been indicative as a cause of the low performance, it was recommended to James’s caregiver that she attempt to run minimally five trials per day. James’s caregiver expressed a desire to run more trials per day; however, due to schedule conflicts in the home, this was not regularly practiced.

**Limitations and Future Research**

One limitation to the present study was that, although all caregivers received initial and follow-up training in selecting effective reinforcers for achieving daily goals, James’s caregiver elected to use a token economy in the form of stickers, with a trip to a toy store as the primary reinforcer. During weekly meetings, additional training was given in the selection of reinforcers, with an alternative of access to a tablet contingent on meeting a goal initially selected and reduction of the exchange ratio in the token economy. Although caregivers received training on reinforcer selection that included written instructions and role-play, future studies should include procedural fidelity checks not only on PT procedures but also the selection and delivery of effective reinforcers.

Another limitation is that participants were presented with an initial set of 23 words and sets of 5 words were added as participants demonstrated fluency. This method was chosen because all participants were novel learners regarding sight words and it was determined that presentation of all 98 words in the beginning would have resulted in lower rates of initial responding, as the likelihood of the participant seeing a previously presented word on subsequent trials would have been low. However, the addition of each set of words resulted in an immediate decrease in rate of correct responding. On occasion, this resulted in participants not meeting their set goal on subsequent frequency building trials. A modification to this design would involve multiple days of practice at a set goal once mastery of the current set of cards had been achieved before adding in subsequent sets of cards, rather than an immediate introduction. This would have allowed participants to gain greater fluency with the set of words thus reducing the risk of their rate falling below the set goal. After initial responding had returned to previous levels, the goal could then be increased.

An additional limitation is that the number of frequency trials were not controlled across participants. All caregivers were able to run multiple trials per day; however, most caregivers reported difficulties with running increased numbers.

| Participants | Frequency Multiplier | Celeration Multiplier |
|--------------|---------------------|----------------------|
|              | Corrects | Incorrects | Corrects | Incorrects |
| James        | X1.00    | X1.00      | X1.47    | X1.06      |
| Albert       | X1.12    | X1.09      | ±1.19    | ±3.38      |
| Sarah        | ±1.04    | X1.13      | ±1.29    | ±1.50      |
| Sam          | ±1.04    | ±1.33      | X1.12    | X1.31      |

**Table 2** Quantitative Values for the Intervention Measures Frequency and Celeration Multiplier between Baseline and Treatment Phases
of trials per day due to schedule conflicts within their home routines. Due to this study being performed in the participants’ home, it was determined that setting an exact number of trials for caregivers to run per day would not be feasible. Further research could set an exact rate of trials for caregivers to run per day to account for possible practice effects within the study design.

**Conclusion**

This study indicates that although greater care should be taken in designing training for caregivers, using synchronous learning to train caregivers to implement frequency building is a viable method. With the increased implementation of both synchronous and asynchronous learning being utilized for multiple grades, due in part to the advent of SARS-CoV-2 as well as improvements in technology, schools and parents will require teaching methods that are both effective and easy to implement. This study demonstrates that frequency building is an effective tool that can meet the needs of a changing educational landscape.

**Declarations**

**Conflict of Interest**  The authors have no conflict of interest to declare.

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