

Choice of Alternative Seating for Preschool Children

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Thesis


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Abstract

Alternative seating options and choice as an antecedent intervention have been previously researched, but little information is known about the relative effects of these strategies. This study evaluated the effectiveness of a choice of alternative seating on in-seat behavior and engagement for preschool children during circle time. An A-B-A-B withdrawal design was combined with an Alternating Treatments Design (ATD) to evaluate the relationship between participant choice and dependent variables while simultaneously comparing alternative seating options in contrast to typical instructional seat (i.e., floor). Results demonstrate alternative seating and choice (in isolation or combined) can increase engagement and in-seat behavior.

Keywords: alternative seating, choice, preschool, engagement, in-seat

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Choice of Alternative Seating Options to Increase In-seat and Engagement Behavior for
Preschool Children during Circle Time

Literature Review

The typical preschool day is composed of two types of activities: teacher-directed (e.g., whole group) and child-directed (e.g., centers and free play). Circle time is a teacher-directed structured activity lasting an average of 15 to 20 minutes (Chien et al., 2010). Although a relatively brief activity, children will be exposed to about 45 hours of circle time over a full 180-day academic year. Circle time provides a powerful opportunity to build upon children's academic and social skills (Benedict, 2007) and provides children with numerous opportunities to demonstrate learning, which can facilitate their transition to elementary school (Dodge & Colker, 1992). However, children tend to engage in higher rates of challenging behavior during teacher-led activities (Zaghlawan & Ostrosky, 2011).

Benefits of circle time require preschoolers to be engaged in the teacher-directed activities. Fisher et al. (2018) defines engagement as the quality of student's involvement, enthusiasm towards learning, and interest level during learning. Children who are actively and positively engaged in structured classroom activities and tasks made improvement in emotional regulation skills during preschool (Williford et al., 2013). In general, expectations during circle time requires children to sit on a carpet or in chairs and teachers to sit at or above the children's level (Chen & Kim, 2014; Emilson & Johansson, 2013). For children who are hyperactive, remaining seated during circle time poses a potential challenge. Instead, they may fidget with objects, rock in their chairs, or repetitively tap hands or feet (DuPaul & Stoner, 2003). With limited time for teacher-instructed activities in preschool classrooms, teachers are often left

feeling stressed in an effort to meet state and federal mandates (Hall-Kenyon, 2014). Since teacher-directed time is limited, it is important to have preschoolers engaged during circle time to obtain the information being taught and to reduce teacher stress.

Alternative Seating

A variety of strategies can be used in the classroom to help children engage, including environmental cues and modifications (Simpson et al., 2008). A highly recommended approach by occupational therapists is the use of sensory processing strategies (Watling, 1999).

Alternative seating is a previously studied intervention that provides students with a different method of seating during teacher-led instruction. Often stability balls, chairs, and rocking seats are used as an alternative to the traditional desk or floor options. Previous research has focused on class-wide interventions, elementary age children, or students who have known disability diagnoses (Bagatell et al., 2010; Fedewa & Erwin, 2011; Kromback, 2016; Schilling et al., 2003).

One study that investigated alternative seating for young children (Schilling and Schwartz, 2004) used a single-subject withdrawal design to assess the effects of therapy balls on sitting and engagement with four preschool students diagnosed with Autism Spectrum Disorder (ASD). Each child sat on the therapy ball with a stabilizer during different instructional times for at least 10 min per school day for a 3-week period. Data were collected using Momentary Real Time Sampling set at a 10 s interval. The results indicated that all four students displayed improvement in engagement and three students displayed an immediate positive change when using the therapy ball with stabilizer. All teachers and staff reported strong support for the use of therapy balls for classroom seating.

Seifert and Metz (2016) assessed the effects of alternative seating on engagement in preschool circle time. Wiggle cushions were implemented as a class-wide intervention and data were collected on whether or not the target students chose to attend circle time. Participants were fifty-two preschool children across four classrooms. Engagement was rated from video recordings using the Child Behavior Rating Scale with 5-point rating scales for attention, persistence, involvement-distractibility, and joint attention. The results yielded higher participation in activities and lower off-task interactions when the intervention was in place. Teachers reported misuse of the cushions towards the beginning of the study, but as the novelty wore off, they became very helpful to the children who needed to move.

Bagatell et al. (2010) assessed the effects of therapy ball chairs on engagement and in-seat behavior with male kindergarten and first grade students diagnosed with ASD. Data were collected during the entire 16 min circle time over 4 weeks. Researchers recorded data on the duration of time participants were out-of-seat and disengaged. The results did not suggest a functional relation between alternative seating and engagement but, the data suggested an alternative seating option decreased variability in in-seat behavior. During the last 19-day data collection period, Bagatell and colleagues added a social validity measure and allowed participants a choice of seating. Two of the six participants chose the ball two of five days, two chose the ball seating at least four of five days and two chose their regular chair. Teachers did not feel the use of therapy balls was very effective. Currently, this is one of only two published studies using a choice of alternative seating during the intervention. It suggested that children may be unlikely to choose alternative seating, but the outcomes are limited to elementary-aged children with ASD.

Hoofman (2018) compared the effects of stabili-t stools, stability balls and the typical seating assignment on in-seat and on-task behavior with three male students ages 6 to 8 years old. All participants had a diagnosed disability. A multiple baseline across participants was combined with an alternating treatments design to rapidly alternate between intervention conditions. In the last condition, choice, participants were able to choose which alternative seating method (stabili-t stool or stability ball) they would like to use during academic instruction. In the choice phase, there was no difference in choice allocation for two participants and one participant always chose the stabili-t stool. The results indicated both types of alternative seats significantly increased in-seat behavior and slightly increased on-task behavior. For two participants, the choice phase yielded the highest levels of in-seat and on-task behaviors across the study.

Child Choice

Choice opportunities in the classroom are a practical and effective procedure for increasing engagement and decreasing challenging behavior (Kern et al., 2001). Offering students choice for non-preferred tasks or tasks they find challenging gives them more control over their own learning (IRIS Peabody, 2022). The integration of choice-making opportunities into academics and reinforcement programs has proven to be important for typically developing children (Tiger et al., 2006) and children who exhibit challenging behavior (Dunlap et al., 1994).

The act of choosing is generally reinforcing because it results in greater access to contexts or items that are momentarily valuable to the person making the choice (Fisher & Mazur, 1997). When considering the act of choosing is reinforcing, it proves the reasoning that recipients of behavior-change technology should be involved in the social validation process (Hanley, 2010). The purpose of social validity is to assess the viability and acceptability of a

programmed intervention with all relevant consumers. Heal and Hanley (2008) discovered less than 3% of children receiving behavior-change procedures had input in the selected intervention. To have socially valid outcomes, children receiving behavior-change procedures need to have their preferences and opinions represented.

The limited research on student choice alternative seat and the primarily positive outcomes of previous studies on alternative seating display the need for further research on the demographic of children who might benefit from the choice of alternative seating. The primary research questions for this study are:

1. Does use of a single alternative seating option for preschool children who have low-engagement during circle time result in increases in engagement and in-seat behavior?
2. Does a choice of multiple alternative seating options (i.e., choice) for preschool children who have low-engagement during circle time increase engagement and in-seat behavior?

Methods

Participants

Participants in this study were two preschool-aged children who were identified by their teachers as having low levels of engagement and high rates of out of seat behavior during circle time. In addition to the teacher report, a circle time observation was conducted by the researcher to determine if participants behaviors aligned with the teacher report. Additional inclusion criteria were: 1) teacher report that circle time content is appropriately developmentally matched to child language and cognitive performance, 2) agreement from Occupational Therapist that the child might benefit from alternative seating, 3) demonstrated the verbal skills to provide assent to participate in the intervention, and 4) between the ages of 36 and 60 months. Participants were excluded from the study if they did not meet these criteria, had frequent absences from school or

had a physical disability which prohibited them from safely and independently sitting on the alternative seat or floor.

The researcher recruited participants after discussions with classroom teachers, the school Occupation Therapist and observations of students. For one participant, the researcher provided the teacher with a consent form for the participants' caregivers and explained the study in detail. For the second participant, the researcher met with the participants caregiver to describe the study and obtain consent. The consent form detailed the primary goals of the study, details of the intervention, potential risks, and benefits of participation. The researcher also asked if the caregivers had any concerns. Both participant's caregivers expressed no concerns with the study. In addition to parent consent, child assent was assessed each session by honoring their request if they verbally stated, "no" after being asked to use an alternative seat.

Participants were between the ages of 42 and 54 months at the onset of the study. The first participant, Hank, was a 42-month-old White (Non-Hispanic or Latino) male. At the start of the study, he did not have a disability diagnosis. During the study, Hank was screened for Occupational Therapy and behavior services, but the results of screening were not yet known when the study concluded. The teacher reported, "focusing on emotional regulation, specifically around task demands." The teacher also reported Hank liked tractors, Thomas the Train, playing football on the playground, and talking about his chickens at home. The second participant, Luke, was a 54-month-old White (Hispanic) male. He had a diagnosis of Autism Spectrum Disorder (ASD) and Congenital Hypotonia. At school he received speech services and Occupational Therapy. Outside of school, Luke participated in Equine-assisted therapy. His teacher reported the study aligned with his goals in the classroom developed by his parents and teachers, which were to remain seated during circle time and to participate by answering

questions. For both participants, the Occupational Therapist recommended the HowdaHug chair as a seating option.

The primary implementer was a White, non-Hispanic female completing a graduate degree in Applied Behavior Analysis within a special education department. She is a licensed special education teacher (K-12) who was accruing hours for behavior analysis certification. Throughout the study, the primary implementer was receiving supervision from a doctoral level BCBA who was White (non-Hispanic) female. The primary implementer conducted all sessions for both participants was the primary data collector and trained two secondary data collectors. Both secondary data collectors were White, non-Hispanic female graduate students who were also enrolled in the same Applied Behavior Analysis program

Settings

All intervention sessions took place in an inclusive private preschool located in Middle Tennessee where both participants attended. The preschool is attached to a college campus building, with 8 inclusive classrooms, a gym, research rooms, outdoor space and a library. Each classroom is composed of neurotypical children and children with developmental disabilities. The classrooms for both participants had two community tables, a kitchen and dramatic play area for centers, a carpet in the center of the room, a 'cool down' corner, and a bathroom. The space was arranged so the students could independently move around the room. The classrooms followed a visual daily schedule posted within the room. Daily jobs for each student were also posted on the wall where circle time takes place.

For Hank, the lead teacher was a White (non-Hispanic) female in her thirties. At the time of the study, she had 10 years of teaching experience. In the class there were 11 preschoolers, 1 of them having a labeled diagnosis. For Luke, the lead teacher was a female in her fifties who

identified as White and Native American. At the time of the study, she had 30 years of teaching experience. In the class there were 11 preschoolers, 4 of them having a labeled diagnosis. Circle time, a whole group activity, was an average of 8 min and ranged 4:00-15:00 min of teacher-led instruction that occurred once a day. Circle time typically included an opening and closing song, deep breathing exercises, discussion about who was present, a question of the day, book reading and social skills review. Learning during circle time took place with all of the students seated on a carpet on the floor. All participating teachers used both vocal speech and also used intermittent American Sign Language (ASL) to communicate with all of the students. The circle time activities were designed to promote peer socialization, language acquisition and early academic skills.

The preschool used a tiered intervention system called the Pyramid Model (Fox et al., 2003). The Pyramid Model provides guidance for the for the implementation of evidence-based interventions which promote the social development of young children as well as more intensive intervention for children with behavior challenges or social-emotional delays.

Materials

Throughout all conditions, the implementer collected engagement and in-seat data with observational software called ProCoderDV (Tapp and Walden 1993). A Canon VIXIA HF R800 was used to film each session for more accurate data collection.

For the intervention, a LAKIKID Wiggle Seat and a HowdaHug Chair were used as alternative seating options. The LAKIKID Wiggle Seat is a slim inflatable wobble cushion with a smooth side and a bumpy side. The cushion is light, portable and low to the floor for easier stability. The HowdaHug Chair is a small portable hardwood chair. It has durable canvas covers and spaced seat slats for ventilation and flexibility. The chair allows for minor rocking. This

chair was recommended by the schools Occupational Therapist because, “The HowdaHug provides proprioceptive input and vestibular input when used on a floor or chair. It provides proprioceptive input by hugging the body. The use of proprioceptive input provides us with a sense of body awareness and regulates the sensory system. The chair also allows for vestibular input by rocking while still keeping the body secure. It is a great alternative to other dynamic seating systems because too much vestibular input can increase excitability and decrease regulation. When offering seating devices, you must look at the entire child the medical diagnosis, clinical observations to assess muscle tone/strength, standardized assessments, and collaboration with the team (family, teachers, therapists).” In contrast, the schools Occupational Therapist did not recommend the wobble cushion because it does not provide enough stability and structure for the child.

Response Definitions and Measurement Systems

Data was collected on two variables: engagement and in-seat behavior; in-seat behavior served as the primary dependent variable on which phase change decisions were made (i.e., change between choice and no-choice phases). Data on these behaviors were collected using 5 s Momentary Time Sampling (MTS). Throughout the entirety of the study, the primary variable, in-seat, was defined as any portion of the child’s buttocks in contact with any portion of the designated seat while facing forwards. Examples included sitting with legs crossed, leaning back and sitting with legs flat on the or leaning back on the seat, sitting on heels. Non-examples included laying on stomach or back, facing away from the appropriate activity, tabletop position and standing on feet or knees.

The secondary variable, engagement, was defined as the student positioned towards and looking at the appropriate activity such as the primary teacher, on-task peer, instructional

materials or whole group activity and either interacting with the materials or listening and responding to the speaker. Examples included orienting and responding with on-task comments to peers, looking at the speaker or designated materials, raising hand to participate, blurting out an on-task comment, touching or playing with assigned materials and moving hands while remaining seated. Non-examples included the student orienting away from the appropriate activity, misuse of materials such as tearing or throwing, making off-task comments, staring at the ground, or leaving the activity without appropriately requesting (i.e., bathroom or water break). For Luke, this definition was modified to include looking *near* rather than *at* a teacher or peer (e.g., above their head or below) as long as he was not clearly actively looking at something that was unrelated (e.g., a peer who is engaged in challenging behavior or non-related materials in the classroom) or oriented away from the activities during circle time.

Data were collected on verbal and physical teacher prompts to ensure they remained at similar levels across conditions. A verbal prompt was defined as any spoken comment made by the teacher in an attempt to get the target student to sit back down in the proper position. Examples include the teacher making statements such as, “sit back down” or “we sit like this.” Non-examples include general prompts made towards the whole class to sit. A physical prompt was defined as any physical attempt made by the teacher to get the target student to sit back down in the proper position. Examples include putting the student in their lap, pulling the student back to their spot, or tapping the student. Non-examples include dancing with the student and high-fiving or fist bumping the student.

MTS was used to collect data on the presence of the target behaviors during the observation. The session was recorded so implementors would score the video with greater accuracy. ProCoderDV software was used to alert the observer to record participant engagement

and in-seat behavior every 5 s. The use of a shorter interval, such as 5 s, when using MTS leads to greater accuracy in data collection (Ledford et al. 2015). Percent of engagement behavior across all sessions was calculated by dividing intervals engaged by total intervals in the observation. Percent of in-seat behavior across all sessions was calculated by dividing intervals in-seat out of total required in-seat intervals. For example, if the student was told to move spots, told to stand up for calendar duty or prompted to stand up to point at something the interval was marked as “not required.”

Experimental Design

This study used a single case design to examine the use of choice and alternative seating on preschooler engagement and in-seat behavior. Single case designs are a quantitative experimental approach in which participants serve as their own control (Ledford & Gast 2018). In particular, a combination design was used in which we combined an A-B-A-B withdrawal design and an Alternating Treatments Design (ATD). The A-B-A-B withdrawal design was selected to evaluate a potential functional relation between a participants’ choice of alternate seat and an increase in academic engagement and in-seat behavior. An ATD was chosen as a means to simultaneously compare engagement and in-seat behavior when alternative seats were used in contrast to the typical instructional seating assignment (i.e., floor). Combining the two designs allowed us to detect any interaction effects between choice effects and alternative seating effects.

Procedures

During all conditions each individual participant was observed at the same time daily during the same instructional time. The teachers were told to prompt the student as they usually would, and the researcher did not engage with the student during the observation. In all conditions the child could request to discontinue filming or using the seat at any time. Originally,

the researchers planned to leave the other seating options out of the room, but if another student requested to use one the researcher gave it to them for circle time.

No-choice phases (A)

Floor. In this condition, the researcher filmed the participant from the back of the room. The prompt for all students to sit on the floor was given by the teacher. Both classroom teachers reviewed sitting expectations before circle time.

Wobble cushion. In this condition, the researcher told the participant, “I brought you a wobble cushion to sit on today, okay?” Upon agreement, the researcher moved to the back of the room to film the participant. If the participant said no or looked confused, the researcher modeled how to use it and said, “you can choose to use it, or I can give it to a friend to use.” If the child said no, the seat was given to another student and the participant was filmed while they were sitting on the carpet.

HowdaHug chair. In this condition, the researcher told the participant, “I brought you a chair to sit on today, okay?” Upon agreement, the researcher moved to the back of the room to film the participant. If the participant said no or looked confused, the researcher modeled how to use it and said, “you can choose to use it, or I can give it to a friend to use.” If the child said no, the seat was given to another student and the participant was filmed while they were sitting on the carpet.

Reinforcement. For Hank, the second no-choice phase was modified to include a choice of train or boat video at the end of circle as reinforcement for sitting in the chair. Similarly, the second no-choice phase was modified for Luke to include a choice of ocean or monster video at the end of circle as reinforcement for sitting in either the wobble cushion or HowdaHug seat. The

researcher stated, “I brought you a chair to sit on today. First sit in the chair for circle, then we can choose a (preferred topic) video to watch after.”

Choice Phases (B)

In the choice phase, the researcher told the participant, “I brought two types of seats today or you can sit on the floor. Which one do you want?” Once the student made a choice, the researcher gave them the HowdaHug chair, wobble cushion, or removed the seating options and went to the back of the room to film.

Interobserver Agreement

Two secondary observers were trained in a 1-hour training session to review the research questions, data collection processes and target behavior definitions. The secondary observers watched practice videos of students displaying the target behaviors and used ProCoderDV to record data. The observers were required to reach a minimum of 80% agreement for each behavior across two practice video sessions prior to data collection in order to achieve mastery criteria. During the study, if a secondary data collector fell below 80% reliability, discrepancies were discussed with the primary researcher and they were retrained using the same initial procedures.

The type of interobserver agreement (IOA) measured was point-by-point agreement. For each participant, IOA data were collected for a minimum of 30% of observations in each experimental condition. An agreement occurred if both data collectors marked that the target behavior either occurred or did not occur in the same interval. A disagreement was marked if one observer marked the behavior occurred and the other did not. IOA was collected individually for each target behavior. The formula for IOA was (number of intervals agreed/number of intervals

agreed + number of intervals disagreed) multiplied by 100. All IOA calculations, agreements and disagreements were reviewed with the secondary observer.

Procedural Fidelity

During each experimental condition, procedural fidelity was measured to ensure conditions were conducted as intended. Procedural fidelity data were collected across a minimum of 30% of all conditions for each participant by a trained observer. The trained observer watched and recorded implementer behavior from a video recording of the session. Inter-observer agreement for procedural fidelity was collected for a minimum of one time per condition to monitor the reliability of scored trainers. The percent of procedural fidelity agreement for each session was calculated by dividing the smallest score by the larger score and multiplying by 100.

Social Validity

Social validity was measured by monitoring participant preference of alternative seating and teachers' choice of seat. Data on participant preference can be collected with young children and individuals with language or cognitive impairments (Hanley, 2010). In the no-choice phase, data were collected on the number of times the child dissented from a specific seat. Starting in the first choice phase, data were collected on the cumulative number of choices made by the child for each seating option. The participants' choice was continuously monitored to assess whether the intervention was preferred.

To measure whether the intervention is preferred for teachers, data were collected on whether the teacher continued to use an alternative seating option for the child upon completion.

Results

Changing Conditions

Data entry and graphing occurred after every session. Conditions changed when data were stable and there were sufficient data in each condition. Within the no-choice phase, each child was told to use each seat a minimum of three times. If a participant said no twice in a row to a seat and there were sufficient data for other seats, the researcher moved to the choice phase. This occurred with both participants. Within the choice phase, sessions concluded when there was a minimum of three sessions in the same choice of seat.

Characteristics and Tools for Analysis

To conduct visual analysis of the data, the primary researcher used Microsoft Excel and Google Sheets. The researcher compared percentage of intervals the participants were in-seat and engaged across choice and no-choice phases and for each seating type. Child preference data was used to evaluate social validity. Since the intervention occurred in the natural environment of the classroom, each session varied in duration. For Hank, circle time ranged from 5–15 min. For Luke, circle time ranged from 4–12 min. To address this, an additional analysis was conducted that included the first several minutes of each activity (5 min for Hank, 4 min for Luke), to detect whether relations found were dependent on total activity duration. The graphed results are in Appendix A.

In-seat Behavior

Choice (A-B-A-B comparisons)

During choice phases, Hank always selected wobble cushion and Luke nearly always selected floor. Thus, conclusions drawn about the impact of choice can only be made about these seating options.

For Hank, Figure 1 shows the in-seat data for the wobble cushion were consistently above 90% across all conditions. The average percentage of in-seat behavior was 97.15%. In the first no-choice phase (A), in-seat data ranged from 96.5%-99% with a mean of 97.8%. In the first choice phase (B), in-seat data ranged from 96%-99.3% with an average of 97.4%. For the second no-choice phase (A), in-seat data ranged from 92.9% to 98.8% with a mean of 95.03%. In the second choice phase (B), in-seat data ranged from 96.1%-100% with an average of 98.33%. Because data were at or near ceiling levels across conditions, no effect of choice on in-seat behavior was identified.

For Luke, Figure 2 shows the in-seat data for the floor in the first no-choice phase (A) ranged from 41% to 99%. The average percentage of intervals in-seat was 81.5%. The researcher determined the data were not going to stabilize in a sufficient amount of time, so the no-choice phase concluded after 8 sessions. In the choice phase (B), Luke chose to sit on the floor for 4 sessions. The data ranged from 88.1% to 100% and had a mean of 95.7%. Although there is some overlap for in-seat data between conditions, the choice phase was consistently above 88.1%; thus, there is initial evidence that choice resulted in increased in-seat behavior although more data are needed to determine a functional relation.

Alternative Seating (Alternating Treatments Comparisons)

During the first no-choice phase, Hank assented to use the HowdaHug chair once and the other seats each time they were offered. During the second no-choice phase, Hank assented to use all seating options when presented, with the addition of reinforcement for using the assigned option. Although insufficient data exist for the HowdaHug chair condition in the first phase, across both phases, Hank was in seat most often when that seating option was in place, with high

and stable levels for the wobble cushion and lower and more variable data in the floor condition, especially in the first phase.

During the first phase, Luke consented to use the wobble cushion once and did not assent to use the HowdaHug chair at all. During the choice phase, he chose the Howdahug chair once and the floor all additional opportunities. Thus, it is not yet possible to compare differential effects of seating options on in-seat behavior.

Engagement

Choice (A-B-A-B comparisons)

During choice phases, Hank always selected the wobble cushion and Luke nearly always selected the floor. Thus, conclusions drawn about the impact of choice can only be made about these seating options.

For Hank, Figure 3 shows the engagement data for the wobble cushion were consistently above 86.2% across all conditions. The average percentage of engagement was 93%. In the first no-choice phase (A), engagement data ranged from 83%-99% with a mean of 94%. In the first choice phase (B), engagement data ranged from 97.6%-99.3% with an average of 99%. For the second no-choice phase (A), engagement data ranged from 76% to 99% with a mean of 90%. In the second choice phase (B), in-seat data ranged from 94.5%-100% with an average of 98.3%. Because data were at or near ceiling levels across conditions, no effect of choice on engagement was identified.

For Luke, Figure 4 shows the engagement data for the floor in the first no-choice phase (A) ranged from 43.8% to 89%. The average percentage of intervals engaged was 66.8%. The researcher determined the data were not going to stabilize in a sufficient amount of time so the no-choice phase concluded after 8 sessions. In the choice phase (B), Luke chose to sit on the

floor for 4 sessions. The data ranged from 90.3% to 97.9% and had a mean of 94.2%. Although there is some overlap for in-seat data between conditions, the choice phase was consistently above 90.3%; thus, there is initial evidence that choice resulted in increased engagement although more data are needed to determine a functional relation.

Alternative Seating (Alternating Treatments Comparisons)

Although insufficient data exist for the HowdaHug chair condition in the first phase, across both phases, Hank was engaged most often when that seating option was in place. He had variable levels for the wobble cushion in both no-choice phases, but consistently high engagement in the choice phases. The floor had lower and more variable data across both no-choice phases.

During the first phase, Luke consented to use the wobble cushion once and did not assent to use the HowdaHug chair for any session. During the choice phase, he chose the Howdahug chair once and the floor all additional opportunities. In the following no-choice phase, Luke assented to sit on the wobble cushion with additional reinforcement for using the assigned option. Thus, it is not yet possible to compare differential effects of seating options on engagement.

Average Behavior in Alternative versus Typical Seating

For Hank, engagement and in-seat behavior data were calculated across all conditions comparing alternative seats to the floor. The average percentage of intervals Hank was in-seat on an alternative seat was 97.79%, compared to the floor at 85.5%. The average percentage of intervals Hank was engaged on an alternative seat was 95.75%, compared to the floor at 88.14%. Therefore, the alternative seat increased engagement and in-seat behavior across all conditions.

Student Preference

Student preference was evaluated to assess the validity of the intervention. In both choice phases, Hank preferred the wobble cushion over the floor and HowdaHug chair. Additionally, in the first no-choice phase, Hank declined to sit on the HowdaHug chair after the first session. Similarly, Luke declined to sit on the wobble cushion after the first session and declined the HowdaHug chair for the entirety of the first no-choice phase (A). When he was presented with a choice, Luke chose the HowdaHug chair for the first session, then consistently chose the floor. The HowdaHug chair was the least preferred alternative seating option for both participants.

Teacher Prompts

Since teacher prompts were not a controlled variable in the study, data were collected for each session to assess if there was a difference in the amount of prompting in each seating assignment. For Luke, his teacher provided him with an average of 1.4 prompts per circle time. Across all sessions, 79.2% of the prompts occurred when he was seated on the floor. For Hank, he averaged less than 1 prompt per circle time. Out of the total sessions, 66.6% of prompts were given when he was seated in an alternative seat.

Social Validity

Teacher preference was evaluated to assess the validity of the intervention. Upon conclusion of the intervention, Hank's teacher was notified the alternative seating options were left in the classroom if she wanted to continue to use them. After the conclusion of the second no-choice phase, she had not seen the message and was unaware the HowdaHug seat and wobble cushion were available. However, Hanks's teacher gave Hank a chair to use during circle time (observed by the researcher via covert observation in a booth). For the remainder of the week,

the teacher gave another student in the class the HowdaHug seat and reported engagement and in-seat behavior increased for that child.

Reliability

Interobserver agreement data were collected for 30.4% of sessions across conditions for Hank and 53.5% for Luke. A secondary observer recorded data independently of the primary observer using Momentary Time Sampling (MTS) on Digital ProCoderDV. IOA was calculated using point-by-point agreement for both dependent variables (Table 1, Table 2) and teacher prompts (Table 3). Intervals were considered an agreement when both observers coded the participant as in-seat/not in-seat or engaged/not engaged at the end of each 5 s interval. IOA data were calculated and monitored by the primary observer. A discrepancy discussion occurred if IOA agreement fell below 80%. Across all conditions, IOA was an average of 97% (89-100%) for H and 96.07% (65.75-100%) for Luke. In the choice phase for both participants a range of IOA was not reported because to meet the minimum requirement of 30% of sessions, only one session needed to be coded.

Procedural Fidelity

Procedural fidelity was assessed for 52.1% of sessions across conditions for Hank and 38.4% for Luke to ensure the researcher implemented the procedures correctly across conditions (Table 4). A secondary observer collected IOA for 21.7 % of sessions across conditions for Hank and 15.3% for Luke (Table 5).

Discussion

Summary of Findings

This study provides some insight for considerations to be made for preschool children during circle time. Firstly, the results of this study support previous findings that alternative

seating is beneficial for some children, but not for all (Bagatell et al., 2010). For Hank, alternative seating increased both engagement and in-seat behavior across conditions but there was not enough data for Luke to make a conclusion. Additionally, both alternative seating options yielded high levels of engagement and in-seat behavior for Hank, but he did not prefer the HowdaHug chair.

Furthermore, incorporating participant choice into the study provided valuable information. For Hank, during the choice phase he chose the wobble cushion for every session. This is useful data for a teacher who might want to incorporate a choice of alternative seating option for this particular student. Furthermore, although Luke tried both chairs for a session and had increased engagement and in-seat behavior, he ultimately preferred to sit on the floor. When given a choice to sit on the floor, his engagement and in-seat behavior was higher. Therefore, the data in the first choice phase reflect the act of choosing was an effective intervention.

In addition to a specific seat, it should be noted the environmental arrangement had an impact on student engagement and in-seat behavior. In session 20, Hank had lower engagement and was removed from circle time when the lead teacher was absent, and he was sitting next to a preferred peer. Also, Luke's classroom changed assigned seats and he was placed closer to the teacher during sessions 8-14. All of these variables are important to consider when designing circle time procedures and seating arrangements. We attempted to conduct this evaluation in the context of typical classroom activities and did not control for these potentially influential teacher decisions, although it likely impacted our ability to draw conclusions about the relations between our targeted behaviors (in-seat and engaged behavior) and independent variables (child choice and seating arrangements).

Limitations

There are several notable limitations to this study. Firstly, there is limited data in the no-choice phase because participants declined particular alternative seating options. Although this phase was intended to limit the students to a particular seat, the researcher prioritized the child's autonomy and socially valid outcomes and did not collect data for a specific arrangement if the child did not assent to use that option during the session. Secondly, data collection for Luke's engagement provided a challenge because his engagement looked different than his neurotypical peers. For example, Luke may have been looking at the ceiling or the floor but would still make on-task comments. Engagement presents differently for every child and it is important to individualize considerations around topographical descriptions of engagement. Thirdly, from the time Hank was recommended for the study to when data collection began his baseline participation had increased. The teacher attributed this to him, "being bored" from the old content and she updated her circle time procedures close to the start of the study. Lastly, because this was a single-case design data were limited to two participants and more research should be conducted on a choice of an alternative seat for preschool children.

Implications

The results of this study have several implications for the use of alternative seating in the classroom. This study suggests the use of an alternative seat can increase engagement and in-seat behavior, however using an alternative seat is not preferred for some children. As presented in this study, when Hank was sitting in the HowdaHug seat he had consistently high levels of engagement and in-seat behavior, but it was never chosen in the choice phase. Similarly, Luke had a session in the HowdaHug seat with high engagement and in-seat behavior, but the seat was not preferred. There are two alternative theories to this, the first being this seat is the most

“visibly different” out of the options. For children who frequently use other tools to learn and receive services, circle time is a small portion of their day where the classroom comes together as a whole. Secondly, if the student rocks their body in the HowdaHug seat they can tip over. For Hank, this was an unpreferred experience, but Luke repetitively tipped his body over in the chair and laughed.

Additionally, teachers and practitioners should assess which interventions will be the most efficient and successful. For both participants the intervention was effective but for different reasons. For Hank, the alternative seating option was quick, preferred and successful. For Luke, the choice alone resulted in increased engagement. Therefore, considerations can be made for how to incorporate student choice opportunities prior to teacher-led instruction.

Suggestions for Research and Future Practice

Future practitioners and researchers interested in alternative seating options and choice interventions should consider several factors before beginning implementation. First, understand why a participant qualifies for an intervention and conduct observations to ensure the recommendation aligns with research or intervention goals. In this particular study, Hank’s first sessions had 65% in-seat behavior but 96% engagement. From the teacher's perspective he was fidgety and unengaged, but the direct observation and data collection revealed different information. For a student like Hank, incorporating seating options would be beneficial for increasing in-seat behavior and maintaining high engagement.

Similarly, there were sessions where L had low in-seat behavior but high engagement. When he was out of seat (i.e., laying on the floor), often he would still shout on-task comments and whisper an on-task comment to a peer. For researchers and practitioners, consider how students should be engaging with the content. Although Luke was still listening and

participating, his response modalities and posture did not reflect the typical classroom expectations. Creating flexible classroom expectations or dependent variable definitions for research can meet the participant's individual needs while maintaining socially valid outcomes.

In regards to the wobble cushion, the Occupational Therapist did not believe this seat would be beneficial for either participant because it provides less stability and requires high levels of coordination to use properly. Although, both participants exhibited high levels of engagement and in-seat behavior in this particular seat. When making recommendations to others or declining to use a particular intervention, we should first test our assumptions. Often, interventions are most beneficial when they are individualized to each student. Broad generalizations about particular intervention without being tested could limit our understanding and has the possibility of delaying a child's progress.

Lastly, as reflected in the study, choice opportunities matter. After declining the HowdaHug seat for three sessions, Luke chose to sit on the seat when it was not presented as a demand. Additionally, even in the no-choice phase, Hank chose his preferred reinforcement for sitting in the HowdaHug chair. Giving children choice opportunities in the classroom is a practical way to increase engagement and decrease challenging behavior (Kern et al., 2001).

Conclusions

The results of this study support the previous literature that alternative seating can increase engagement and in-seat behavior, but it may not always be preferred by the student. Additionally, the results of this study support the research that choice opportunities in the classroom are an efficient and practical way to incorporate student preference. The procedural fidelity data demonstrate this intervention may be feasible.

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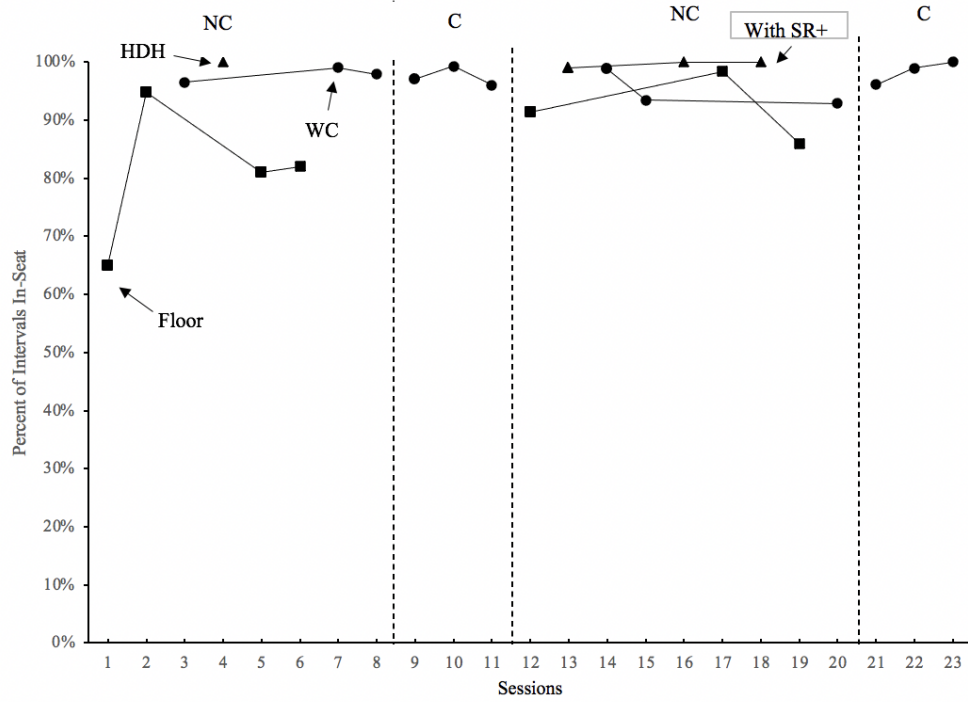
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Figures

Figure 1

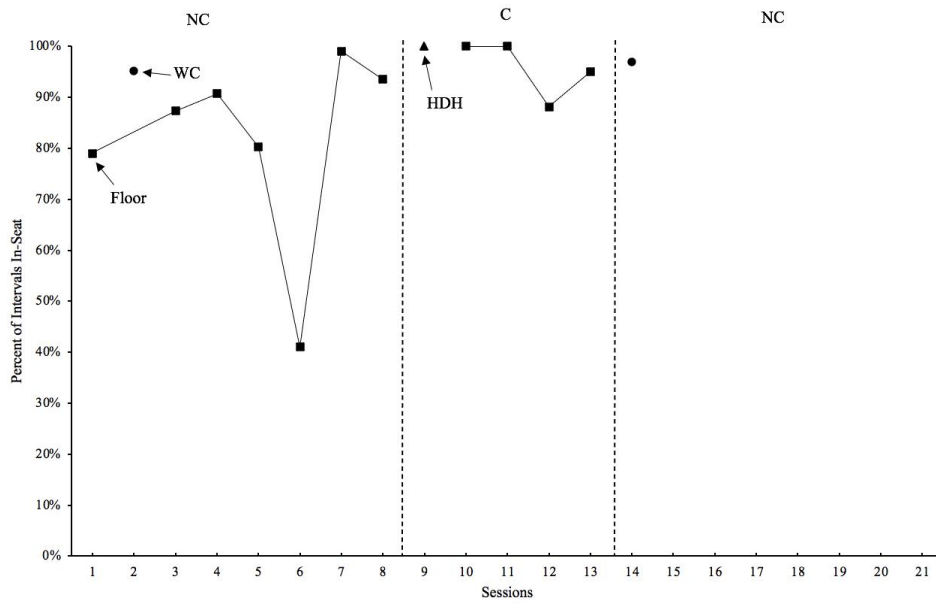
In-seat Data for Hank



Note: NC = no choice. C = choice. Reinforcement was provided for using the HowdaHug chair in the second NC condition only.

Figure 2

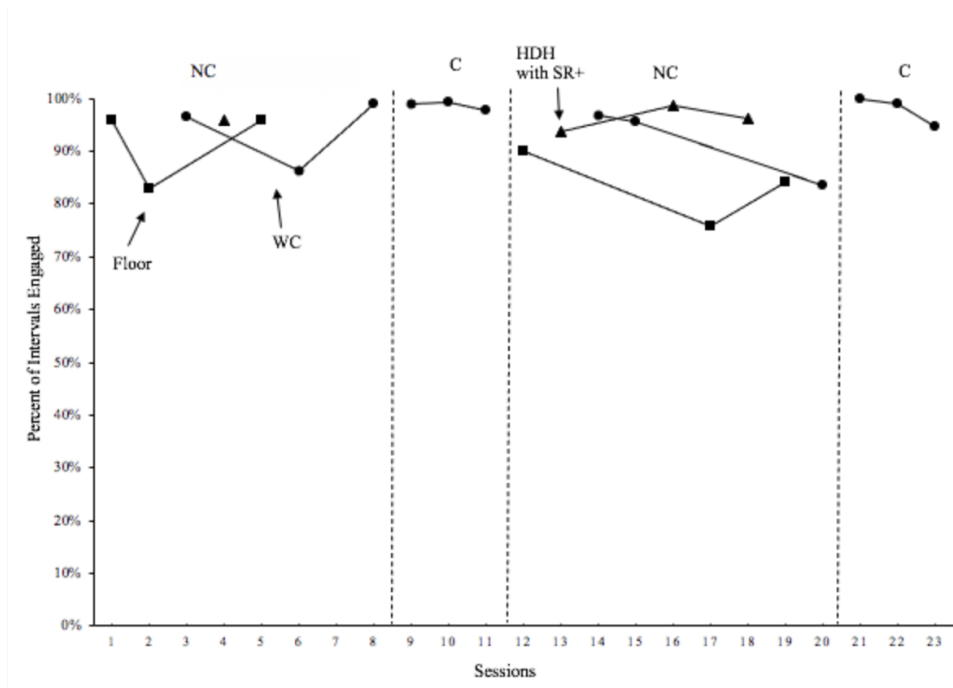
In-seat Data for Luke



Note: NC = no choice. C = choice.

Figure 3

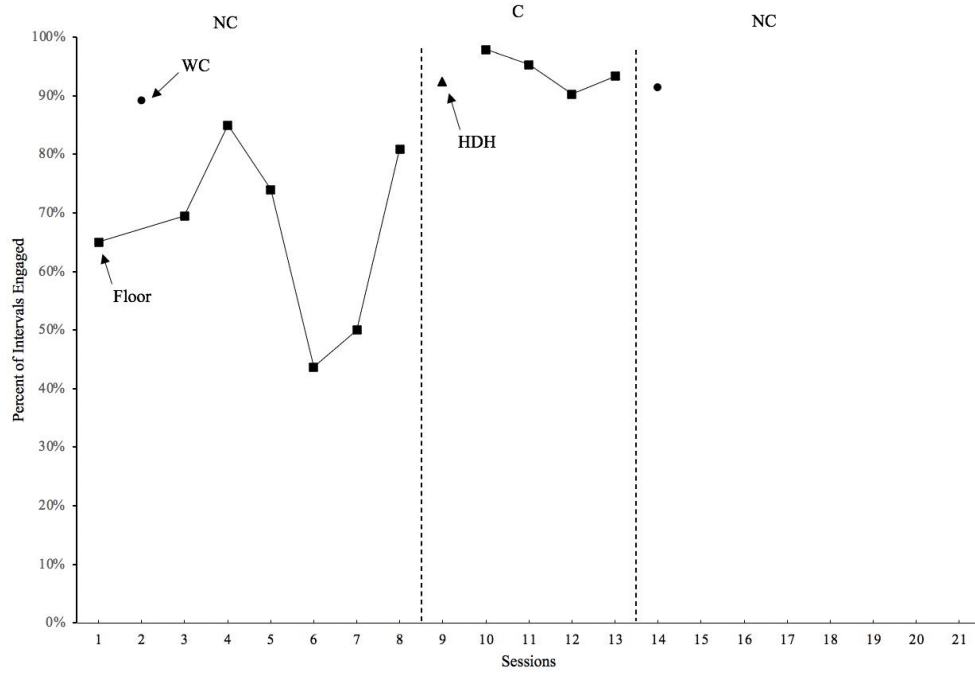
Engagement Data for Hank



Note: NC = no choice. C = choice. Reinforcement was provided for using the HowdaHug chair in the second NC condition only.

Figure 4

Engagement Data for Luke



Note: NC = no choice. C = choice. Reinforcement was provided for using the HowdaHug chair in the second NC condition only.

Figure 5

Quantity of Teacher Prompts for Luke

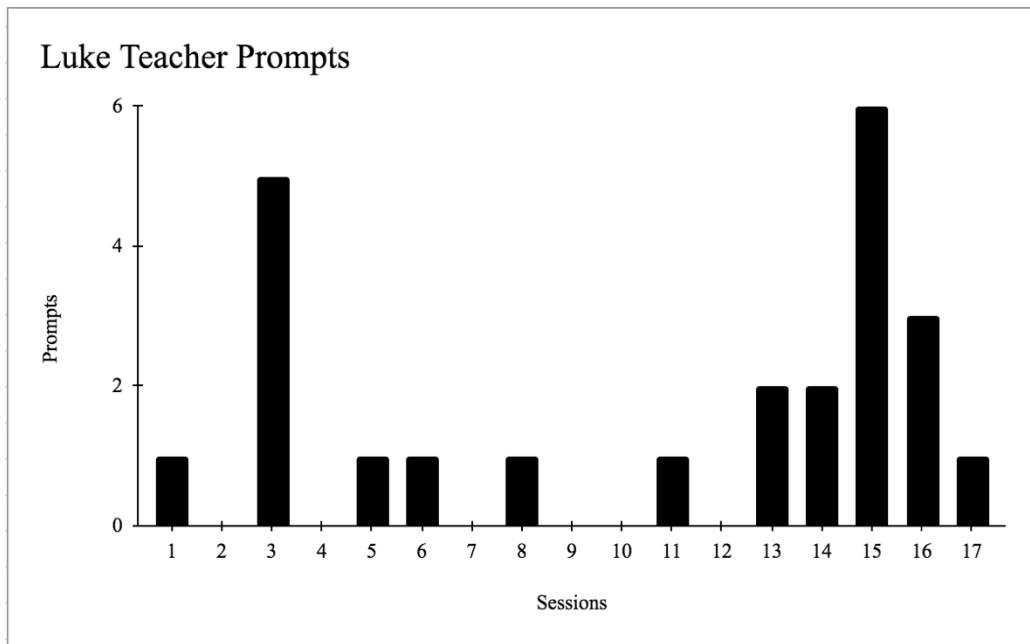


Figure 6

Quantity of Teacher Prompts for Hank

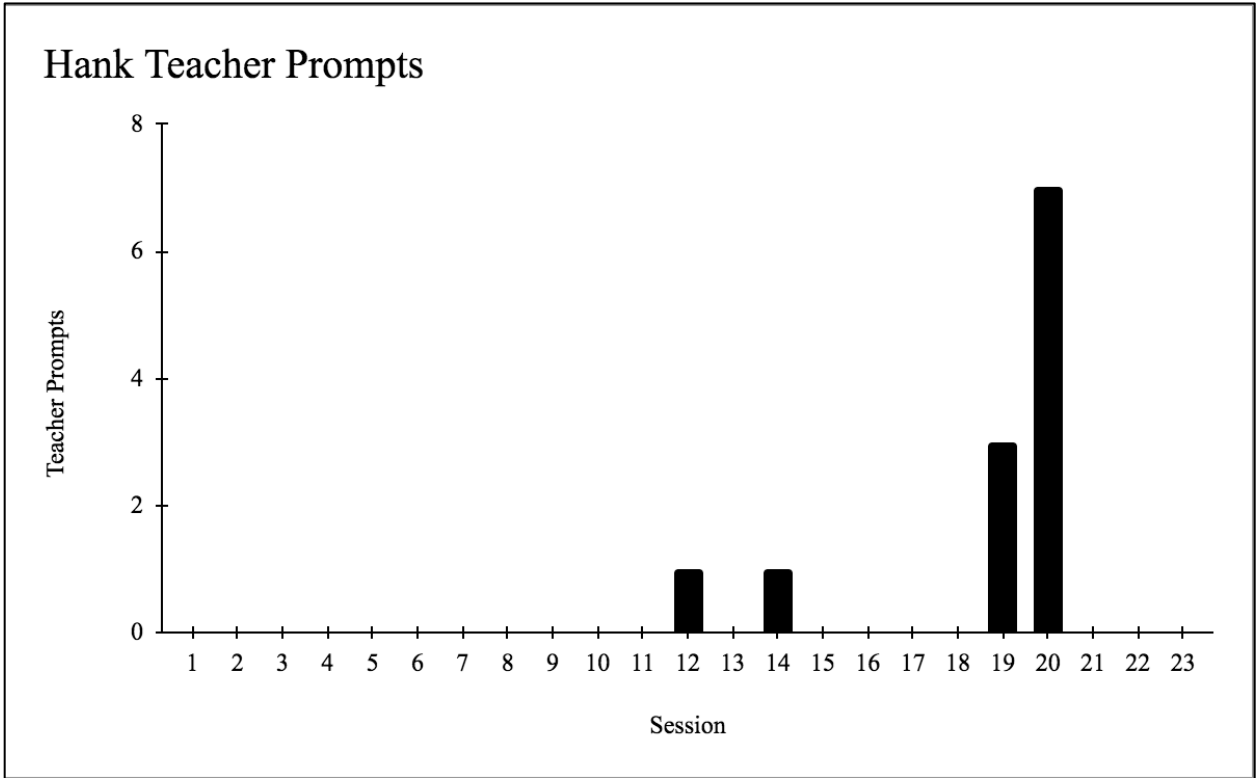


Table 1*In-seat IOA*

Participant	No-choice	Choice	No-choice	Choice
Hank	99% (97-100%)	98%	96.1% (94.5-98.9%)	96%
Luke	96.8% (95.8-97.7%)	100%	99.3% (97.9-100%)	

Note. Values in parentheses reflect range of IOA percentage.

Table 2*Engagement IOA*

Participant	No-choice	Choice	No-choice	Choice
Hank	96.5% (95-97.5%)	98%	90.69% (89-92.3%)	96.3%
Luke	84.26% (65.75-97.5%)	91.9% (91.4-92.3%)	96.5% (93.8-100%)	

Note. Values in parentheses reflect range of IOA percentage.

Table 3*Teacher Prompt IOA*

Participant	No-choice	Choice	No-choice	Choice
Hank	100%	100%	99.2% (97.8-100%)	100%
Luke	98% (96-100%)	98.9% (97.8-100%)	100%	

Note. Values in parentheses reflect range of IOA percentage.

Table 4*Procedural Fidelity*

Participant	No-choice	Choice	No-choice	Choice
Hank	100%	100%	100%	100%
Luke	100%	100%	100%	

Table 5*Fidelity IOA*

Participant	No-choice	Choice	No-choice	Choice
Hank	100%	100%	100%	100%
Luke	100%	100%	100%	

Appendix A

Additional Analysis Accounting for Time

Figure 7

5-Min in-seat (top) and engagement (bottom) data for Hank

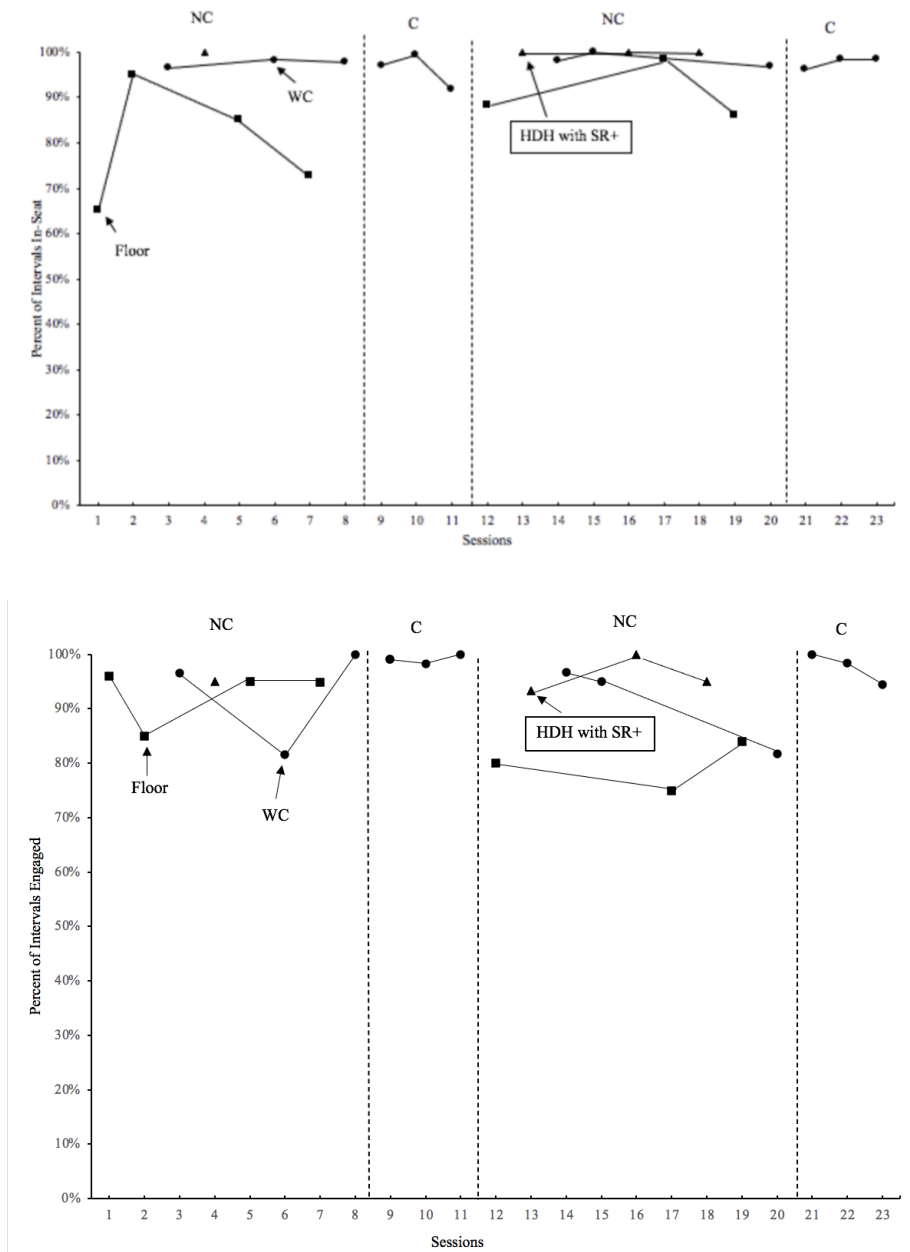
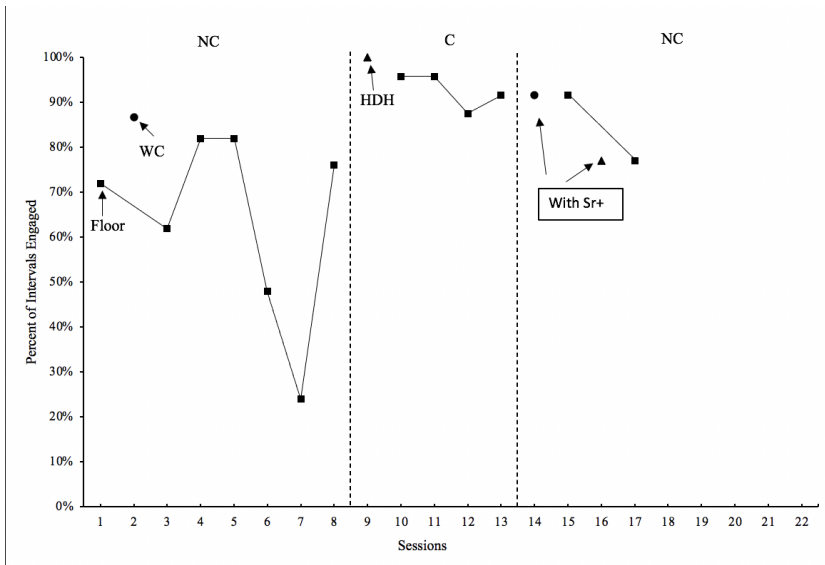
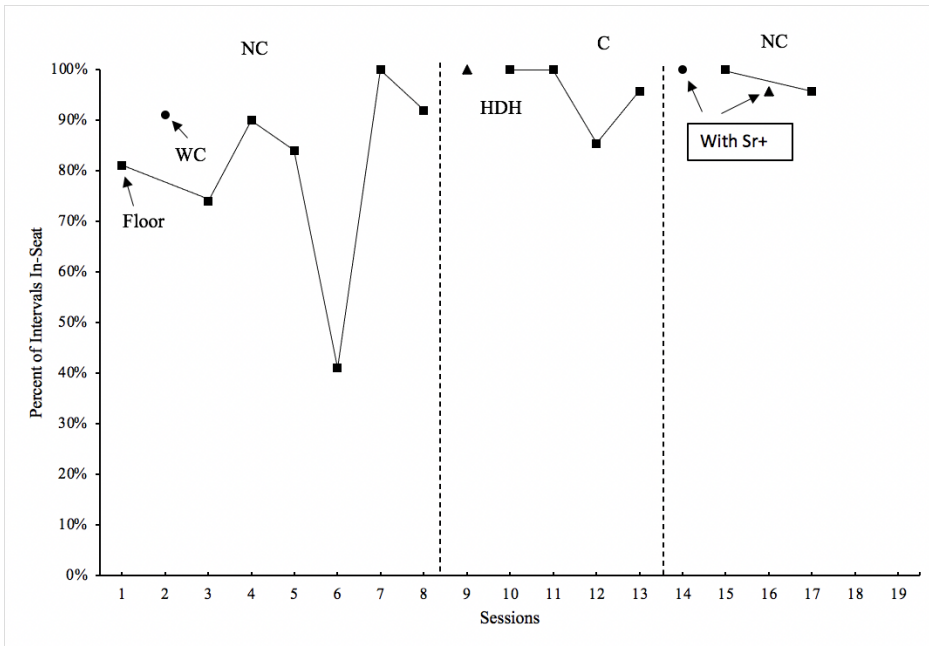


Figure 8

5-Min engagement (top) and in-seat (bottom) data for Luke



Appendix B

Procedural Fidelity Data Sheet

For No-Choice Condition:	Yes/No	N/A
Does the experimenter say, "I brought you X to sit on today, okay?"		
Does the experimenter keep other seat choices out of the room?		
Does the experimenter honor the child's request if they ask to discontinue filming/seat?		
Circle Time Start:		
Circle Time End:		
For Choice Condition:	Yes/No	N/A
Does the experimenter say, "I brought two types of seats today or you can sit on the floor. Which one do you want?"		
Does the experimenter remove other seat choices from the room?		
Does the experimenter honor the child's request if they ask to discontinue filming/seat?		
Circle Time Start:		
Circle Time End:		

Appendix C

Types of Seating



Classroom Carpet



LAKIKID Wiggle Cushion



HowdaHug Seat

Appendix D

Block Randomized Seating Assignments

	Kid 1	Kid 2
1	Floor	Floor
2	HDH	SB
3	SB	HDH
4	Floor	SB
5	SB	HDH
6	HDH	Floor
7	HDH	SB
8	Floor	Floor
9	SB	HDH
1	Floor	SB
2	HDH	Floor
3	SB	HDH
4	SB	Floor
5	HDH	HDH
6	Floor	SB
7	HDH	SB
8	Floor	Floor
9	SB	HDH