

## Toward a Model of Educational Equality: Establishing Social Validity Measures for Inclusion

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### Abstract

Inclusion of students with special education needs (SEN) and especially autism spectrum disorder (ASD) into general education curricula is a challenging practice. In recent years, the practice of inclusion has been expanding within the international school community. Outside of the United States, the process of inclusion is developing rapidly due to an ever-increasing demand. The demand is fueled by families and is compounded by the scarcity of international schools with developed programs and inclusive classrooms. Applied Behavior Analysis provides evidence-based strategies and tactics that support educators and those responsible for inclusion of students SEN and ASD. The purpose of the present study was to use behavioral observation techniques to determine socially valid performance criterion for attending behaviors in typically developing primary school students during group instruction and independent desk work. No direct observation data were found on this subject, to date. Direct observations occurred in situ using whole interval recording procedures across typical students across primary grades one through eight, inclusive. Data were collected under two types of conditions, lecture style instruction, and independent desk work for boys and girls across all grades. The performance criterion could then be used to guide decisions by IEP teams to fade out support of those students with SEN in the general education setting. Results show that typical students attend to the teacher during live lectures an average of 93% of the time using a time sampling data collection technique and 96% during independent desk work.

### Key Words

autism, special education needs, inclusion, applied behavior analysis, attending behaviors, on task, international school

Inclusion of students with special education needs (SEN) and especially autism spectrum disorder (ASD) into general education classes is a challenging practice. In recent years, the practice of inclusion has been expanding within the international school community in some parts of Asia such as in Hong Kong due to increased demand (Greenberg & Greenberg, 2014).

The practice of inclusion was described in detail years ago, as a challenging and controversial practice (Stainback & Stainback, 1995). There were and still are many factors that have been a part of the collective conversation about inclusion in the research literature. Those

factors include: teacher efficacy (Beacham & Rouse, 2012; Chen, Lau, & Jin, 2006; Harrower, 1999; Sharma, Loreman, & Forlin, 2012), attitudes of primary school principals (Sharma & Chow, 2008), the effects that inclusion might have on the regular education students (Feldman, 2002; Koegel, Vernon, Koegel, Koegel, & Paullin, 2012; Rea, McLaughlin, & Walther-Thomas, 2001), effects on students with emotional disturbances and severe disabilities (McKenna, Solis, Brigham, & Adamson, 2018; Harrower, 1999), and the preparedness of teacher training programs (Forlin, 2010; Greer, 2002; Yuen, Westwood, & Wong, 2005; Forlin & Sin, 2010; McKenna, Newton, Brigham, &

Garwood, 2021). Studies investigating parent experiences with inclusion (Tsai & Fung, 2009), and applied studies that have improved **students' attending behaviors and social skills** (Caballero & Connell, 2010; Callahan & Rademacher, 1999; Conroy, Asmus, Sellers, & Ladwig, 2005; Greenberg, Tang, & Tsoi, 2010; Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008) have expanded the discussion on inclusive education in the US and abroad.

Despite the complexity that the practice of inclusion presents to a given school community, inclusion remains central to the **mission of many of today's schools in the US and abroad**. In the US, the Education of All **Handicapped Children's Act (Public Law 94-142, 1975)** contained a least restrictive environment (LRE) directive so that students with special education needs receive lessons to the maximum extent possible alongside their neurotypical peers, in an individualized manner. Decades later, the US continues to grapple with the LRE directive and include students into regular classes in an appropriate manner. Meanwhile, inclusive opportunities for students with SEN and ASD that lead to meaningful changes in those students outside of the US such as in Asia are few and far between. Published research on the subject is scarce. (Greenberg & Greenberg, 2014; Poon-McBrayer, 2004; Wong & Hui, 2008). Even with the growing demand for effective inclusion practices, services and inclusion initiatives have been particularly slow going in Southeast Asia and specifically in Hong Kong (Forlin, 2010; Wong & Hiu, 2008).

One of the significant barriers that teachers and parents face when including students with SEN into the general education setting are deficits in the area of listener behavior, joint attention and other verbal behavior deficits (Greer & Ross, 2008). Joint attention combines social and communication behavior in young children in which the child

and adult or peer use gestures and gaze to share attention with respect to interesting objects or events. This skill plays a critical role in social and language development (Jones & Carr, 2004). Joint attention can be viewed within the response class of attending behavior. Attending behavior has been targeted for improvement through applied research applications in our field of behavior analysis using various strategies and tactics since the early days (Walker & Buckley, 1968).

In the more recent literature on the topic of joint attention, variations in gestures have been found to predict language development in young children (Mundy, Sigman, & Kasari, 1990) and joint attention has been termed a pivotal skill in the development of appropriate language in young children (Charman, 2003). Empirical studies have documented successful tactics found to improve joint attention when it is missing in young children through initiating bids for attention (Taylor & Hoch, 2008) and using script fading to promote bids for attention (Pollard, Betz, & Higbee, 2012).

Attention to the teacher is just one of the many responses or literacies (e.g. listener literacy, reading literacy, writing literacy, digital literacy, and scientific literacy) that students are expected to do in classrooms in order to benefit from general education curricula. In our international school setting we have observed that there are nine behaviors that students are expected to perform regularly on a daily or weekly basis. We call these simply Group Learning Skills (see Table 2). The question for the special education teacher, therefore, becomes how well do we need to prepare our students for group learning? How much attending behavior do neurotypical students have? Applied behavior analysis offers reliable techniques for validating the social behavior of students such as group learning skills

The concept of social validity can be determined by using direct observation techniques with adults or competent individuals performing the target behavior of interest. The term was first described in great detail by Montrose M. Wolf (1978) in an effort to elaborate on a commentary from colleague Donald Baer. The topic of the commentary and their discussion was to define the purpose of the *Journal of Applied Behavior Analysis* as being the publication to describe applications of the analysis of behavior for problems of social importance. Wolf recognized that an investigation of the true meaning of social importance was warranted. Subsequently, Wolf set out to define and describe how behavior analysts might discover measures of social validity across various behavioral applications.

Research on the topic of social validity has since been brought forward by modern practitioners who have advocated for its continued use. Social validity measures have a wide range of applications and, as a concept, have functioned as guiding principle across our science over the decades (Hanley, 2010; Nicolson, Lazo-Pearson, & Shandy, 2020). One useful technique for determining social validity is whole interval recording (Cooper, Heron, & Heward, 2007). When paired with interobserver agreement techniques, the outcomes can be viewed as highly reliable measures of student behavior.

Applied Behavior Analysis (ABA) is a science dedicated to improving the behavior and lives of people to a significant degree through various evidence-based strategies and tactics. ABA has a long history of supporting educators and those responsible for inclusion of students SEN and ASD (Cooper, Heron, & Heward, 1987; 2007; 2019). The purpose of the present study was to collect data in situ on the behavior of attending to the teacher as well as independent desk work using typically developing students

across primary grades one through eight. An equal number of both boys and girls were included as participants. Results would be used to inform special education teachers as to the level of services that a given student with SEN might need in order to be included successfully in a general education class and to signal the process of moving students into a lesser restrictive environment and towards great independence in general education classrooms.

### *Method*

#### *Participants and Setting*

A total of 16 students (Grade 1 - 8; 6 - 13 years of age) from The Harbour School (international school) were included for data collection. One boy and one girl from each grade were nominated to participate in this study based on their overall anecdotal and subjective **description as “appropriate or typical”** according to their general education class teacher. These students received no additional small group nor one-on-one learning support. Furthermore, their typical attending behavior was reflected in their average to above average MAP (Measure of Academic Progress) scores from Term 1 of the 2019 - 2020 school year (See Table 1). Data collection took place in the classrooms of the Harbour School during lesson time of the four core academic subjects (Literacy, Mathematics, **Science and Social Studies**). **Individual student’s** attending behaviors were observed under the two lesson conditions of lecture style instruction and independent desk work. Socioeconomic status for the students was middle class to upper-middle class. Data from Table 3 show the demographics and results from the students observed.

#### *Definition of Behavior*

Attending behavior were defined using an operational definition that was included both observable and measurable components. Students were observed to keep their eyes on the

teacher or instructional materials and as defined as on-task and engaging in any assigned activity. If the student looked away from the teacher or instructional materials, stopped engaging in the assigned activity for more than two seconds, their behavior would be counted as an incorrect response. Plus “+” and minus “-” signs were recorded on the data sheets using pen for correct on task and incorrect off task responses to each of the 10 second intervals throughout the measurement duration using time sampling.

#### *Procedure*

Direct observations occurred in situ using whole interval recording procedures. Data were collected under two types of conditions, lecture style instruction, and independent desk work for boys and girls, across all grades. Using whole interval recording with 10-second intervals, the students’ attending behavior was recorded every 10 seconds for 5 minutes, resulting in 30 recordings. Percentages of each student’s attending behavior (on task) were calculated by dividing the number of intervals of correct responses (student attending and staying on-task), by the total number of intervals (30 per observation) and multiplying the result by 100.

We used a modified whole interval recording procedure. If the student looked away from the teacher during the lecture observations for one to two seconds, but was observed to redirect themselves to the teacher, the interval was counted as on task.

The researchers and data collectors were the authors of the study. The first author had a doctoral degree in special education applied behavior analysis and has been in the field for about 30 years and has been a Board Certified Behavior Analyst for 22 years. The second author had a Masters in applied behavior analysis and has been in the field for about 8 years and has been a Board Certified Behavior Analyst for 6 years.

#### *Interobserver Agreement*

Interobserver Agreement (IOA) was calculated by dividing the number of intervals of agreement of correct responses emitted by each participant, by the total number of intervals and multiplying the result by 100. Table 4 shows the results of the IOA. An agreement consisted of two independent observers agreeing that a participant had emitted a correct response based on the antecedent given. Correct responses were pre-determined and operationally defined prior to beginning the study. A disagreement consisted of one observer having considered a response to be correct while the second observed considered the response to be incorrect. In Phase 1, for Participants A and B, in vivo IOA was assessed using the trial-by-trial method for 100% of naming experience sessions with 100% agreement, and 100% of post-naming experience probe sessions with 100% agreement. For Participants C and D, IOA was assessed for 86% of naming experience sessions with 100% agreement and 86% of post-naming experience probe sessions with 100% agreement. In Phase 2, in vivo trial-by trial IOA was collected for 39% of SLU presentations for all participants with 100% agreement. IOA was calculated for 38% of ID LU presentations for all participants with 100% agreement.

Table 1. Scores on 16 participants from The Measures of Academic Progress (MAP) Standardized Test Fall 2020

Student	Grade	Math	Reading	Language
A	1	N/A	N/A	N/A
B	1	N/A	N/A	N/A
C	2	N/A	N/A	N/A
D	2	247	217	217
E	3	199	189	192
F	3	192	190	185
G	4	212	210	211
H	4	249	220	217
I	5	231	223	220
J	5	225	218	N/A
K	6	220	222	211
L	6	210	211	212
M	7	218	199	211
N	7	247	218	212
O	8	205	216	203
P	8	246	N/A	232

Percentile (Average = 41-60)

1-20	21-40	41-60	61-80	81-100
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Table 2. Group Learning Skills Response Class with Nine Target Behavior and Objectives

Group Learning Skills Target	Objectives
Proper sitting and attention to the class teacher	The student will attend and stay seated appropriately in class to criterion (80% or higher across all subjects).
Respond to instruction given by class teacher (large group) or peers (small group)	The student will correctly respond to instructions from the teacher 80% or higher accuracy across all subjects.
Hand raising appropriately	The student will avoid calling out, raising their hand when they know the answer.
Choral responding	The student will correctly respond to vocal verbal instruction in unison with peers.
Ignore inappropriate behaviors of other students	The student will attend to the teacher and avoid distractions from other students and inform the teacher.
Note taking (Grade 3 and upper primary)	The student will record notes during lectures.
Independent & worksheet skills	The student will perform steps in independent desk work & worksheets
Observational learning/ Naming	Observation learning and Naming should be observed at 80% as per Verbal Behavior Analysis Protocol.
Presentation skills	The student will independently deliver presentations in class as per the school curriculum.

### Results

The percentages of on task behavior for all 16 participants in both lecture and independent desk work conditions are presented in **Table 4. Percentages of each student's** attending behavior were calculated by dividing the number of intervals of correct responses (student attending and staying on-task according to the operational definition of target behavior) emitted by the participant, by the total number of intervals (30 recordings per observation) and multiplying the result by 100.

Table 3. Percentage of on task behavior for all boys and girls in lecture and independent desk work conditions with a total of 16 observations in each condition across Grades 1 through 8, inclusive.

Student	Gender	Ethnicity	Grade	Lecture style instruction	Independent desk work
A	Boy	White	1	100%	100%
B	Girl	Asian	1	93%	100%
C	Girl	White	2	83%	100%
D	Boy	Asian	2	83%	100%
E	Boy	White	3	93%	80%
F	Girl	White	3	100%	100%
G	Girl	White	4	97%	100%
H	Boy	Asian	4	100%	97%
I	Girl	White	5	97%	97%
J	Boy	White	5	90%	83%
K	Girl	White	6	90%	97%
L	Girl	White	6	97%	80%
M	Girl	Asian	7	97%	100%
N	Boy	Asian	7	87%	100%
O	Girl	White	8	100%	100%
P	Boy	Asian	8	80%	97%
Student n=16			Grade n=8	Mean = 93% Range = (80, 100)	Mean = 96% Range = (80, 100)

As shown in Table 4, 78% of our observations (25 out of 32) have a percentage of on-task behavior ranging from 90% to 100%. Only 22% (7 out of 32) of the observations were recorded with a percentage of on-task behavior lower than 90% and none of our observations has a percentage lower than 80%. Overall, the mean percentages for on-task behavior were observed to be 93% of the time during lecture style instruction and 96% of the time recorded during independent desk work. The percentages of on-task behavior in both lesson conditions ranged from 80% to 100%. There was no significant difference in the percentages of attending **between students' age, gender, grade level, and** the two types of instructional formats observed. However, the independent desk work condition

on task behaviors were 3% higher than the lecture condition on task behaviors. There was no positive correlation between the **percentages of a student's** attending behavior and his or her MAP score.

The standardized test called MAP (Measure of Academic Progress) is an assessment used by schools **worldwide to measure students'** growth and achievement in grades K to 12 mathematics, reading, language usage and science. It provides information on how individual students are making progress on standards and if there are any gaps in their learning. Students individually receive a RIT (Rasch Unit) score in each tested area and RIT scores generally range between 140 and 190. For students with an academic level equivalent of

a grade 3, scoring ranged from score somewhere between 140 and 190. In higher grade levels, they may progress to a score between 240 and 300. The range of scores from each grade define the average performance in terms of scores. Results are showed in Table 1. For all but one student in one area (Student L in math) all of the student scores were in the average or above average range.

**Table 4. Interobserver Agreement**

Grades	1-8
Number of IOA Observations	17
Percentage of Observations with IOA	53%
Mean	96%
Range	(67%, 100%)

### Discussion

The data show that the average neurotypical student in one international school attended to group instruction 93% of the time and attended to independent desk work 96% of the time. A few observations can be made from our data, however limited.

First, there was only a 3% difference in the type of instructional format observed between group instruction and independent desk work. In other words, there were no educationally significant differences in attending behaviors observed across lecture and independent desk work instructional formats. Second, the attending behaviors that were observed across the grade 1 through grade 8 students did not differ significantly across the

grade levels. Third, no significant differences were observed across boys and girls. There were eight boys and eight girls in each of the grade levels included in the present study.

Comparisons with the joint attention literature are difficult to make here since language is typically the dependent variable of concern in these studies. In our field of applied behavior analysis, there has been a significant lack of behavioral research data using direct observation procedures such as time sampling on the attending behavior of neurotypical students.

We chose to substantiate our findings through reporting on the MAP standardized test scores. This comparison functions to validate that the attending behaviors of our students subsequently translates to age appropriate and grade level responding.

### Limitations of the Present Study

Our direct observation procedures were limited to two instructional formats in academic subjects. While we included literacy and numeracy classes only, the external validity of our findings could be expanded if additional subjects (e.g. science, social studies) and special subjects (e.g. art, music, physical education) were included as well.

Of note is the cultural population enrolled into our international school. About 85% of the students are expatriate students from twenty or more countries while the remaining 15% are from Hong Kong. While this does represent a relatively diverse population of children, there might be cultural differences observed in the attending behavior in students from other ethnic or cultural backgrounds. Our international school also uses English medium instruction and a US based curriculum. These factors might bias the data in one direction, for example.

### Implications for Future Research

Future research should investigate a few variables that were limited in the present study. Those variables, in our view, include the subject matter being taught, the specific cultural and ethnic backgrounds of the students, and the limited sample size. Our data show results for approximately 5% of the students in each grade level. More direct observational data needs to be collected across more students as well as across more subjects. Additionally, data collection using additional schools and cultures would test for the external validity of our findings. It should be noted that international school students generally represent a middle to upper middle class socioeconomic status. If data were collected, for example, in a local school with all Cantonese speaking students, the data might be observed to be different. Differences might reflect the disciplinary styles in the schools and general cultural trends across populations.

In conclusion, direct observation data from applied behavior analysis techniques can be powerful in determining the social validity of neurotypical student behavior. As special educators, working in inclusive educational classrooms, we constantly strive to teach our students to a level that can result in the fading or withdrawal of services. When we are successful in this remedial mission, we uphold the values of LRE and allow for the students with SEN to benefit from and contribute to the general education setting. Of course, there are benefits to neurotypical students as well, insofar as their overall educational experience is enriched by learning in a neurodiverse environment.

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