

Effects of the TEACCH Program on Maladaptive and Functional Behaviors of Children with Autism

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ABSTRACT

Individuals diagnosed with autism present unique difficulties to service providers compared to individuals with other types of developmental disabilities. Consequently, these individuals require specialized treatment strategies. A structured environment for individuals with autism can provide consistency and predictability, encouraging self-control and independent function. Treatment and Education of Autistic and related Communication handicapped Children (TEACCH) is a program designed to provide the structure and predictability that individuals with autism require to function successfully. The purpose of this study was to examine the efficacy of the TEACCH program to decrease maladaptive behaviors and increase independence in functional activities. Four children, ages 8 to 13, diagnosed with autism, residing at the Chileda Habilitation Institute were studied. Data was collected for 30 days to establish a baseline followed by another 30 days in which TEACCH programming was initiated for two of the four subjects. Results indicated that the use of the TEACCH schedule decreased maladaptive behaviors for one of the subjects receiving TEACCH. The results also found that for one of the subjects, using the TEACCH program increased the ability to independently complete functional tasks.

INTRODUCTION

Autism is a developmental diagnosis of a behaviorally defined syndrome in which symptoms occur on a continuum or spectrum ranging from mild to severe. Autism is viewed by the DSM-IV as a pervasive developmental disorder (PDD) marked by abnormal or impaired development in social interaction and communication combined with a restricted repertoire of activities and interests (Gresham, Beebe-Frankenberger, & MacMillian, 1999). Some typical characteristics of autism include abnormal social behavior, impaired communication, and peculiar interests and behavior (obsessive behavior). In addition to these characteristics, 80% function in the mentally retarded range, with an IQ below 70 (Baron-Cohen & Bolton, 1993). This developmental disorder causes a defect in the systems which process incoming sensory information, causing the individual to over-react to some stimuli and under-react to others (Grandin, 1986). These characteristics are those that are typical for individuals with autism, however the combination of traits exhibited varies as well as their severity. As a result, individuals diagnosed with autism present unique difficulties to service providers compared to individuals with other types of developmental disabilities and consequently require specialized treatment strategies.

One strategy used to treat individuals with autism is to provide a highly structured environment. Panerai, Ferrante, Caputo, and Impellizzeri (1998) demonstrated that children with

autism learn better in a structured rather than unstructured environment. In another study, it was shown that adults with autism had significantly more problems with ritualistic behaviors and in dealing with change than did those without autism when appropriate structures had not been instituted (Van Bourgondien & Schopler, 1996). There are many ways to provide needed structure including: organized materials, clear instruction, and a hierarchical system of prompts. Often structure is enhanced by using visual representations that are not language oriented and define the demands of the presented tasks ([_www.autism-society.org](http://www.autism-society.org)). This strategy allows for predictability in the environment, which in turn allows for the anticipation of events and can enhance self-control and independent functioning for individuals with autism. Research has shown that the use of visual schedules has helped employees with autism anticipate what work they will be doing without having to deal with the monotony of doing the exact same thing each day (Keel, Mesibov, & Woods, 1997). This shows how visual structure can positively influence work performance and motivation.

Treatment and Education of Autistic and related Communication handicapped CHildren (TEACCH) is a program designed to provide the structure and predictability that individuals with autism require to adapt to their environment. The TEACCH program uses visual schedules and is advantageous for individuals with autism because of their strength in visual rather than auditory learning. Often, when confronted with auditory information individuals with autism do not fully understand the demands expected of them (Bondy & Frost, 1994). These auditory stimuli are perceived by individuals with autism as ambiguous and may cause feelings of stress and anxiety leading to a chain of behavioral outbursts (Cesaroni & Garger, 1991). Typical reactions may include repetitive motor or verbal actions, demonstrating self-injurious behavior, withdrawing from the environment, or becoming physically aggressive towards others (Ball, 1999). "My mind is completely visual... There may be two basic kinds of thinking-visual and sequential. Society needs to recognize the value of people who think visually." (Grandin, 1986) This is how one individual with autism, Temple Grandin, describes her need to think visually. The use of visual schedules not only provides the individual with a sense of control over their environment, but also has been shown to decrease maladaptive behaviors. A study conducted by Panerai et al. (1998), found a significant reduction of behavioral problems such as aggressiveness and self-injurious behaviors in children, after utilizing the TEACCH program for eighteen months.

Studies with increased frequency in usage of the TEACCH Program, such as in a home program in addition to the educational program, have shown to significantly improve cognitive and developmental skills as compared to children using the TEACCH Program only during educational periods (Ozonoff & Cathcart, 1998). This study (Ozonoff & Cathcart, 1998) also found that children with autism and mental retardation utilizing an additional TEACCH home program made an average of 9.6 months of developmental gain in a period of four months.

Individuals with autism are just as unique as those who are not diagnosed with a developmental disability, therefore each possess their own strengths and weaknesses. A vital aspect of TEACCH is that its curriculum is based on the individual's strengths and weaknesses. A focus of the TEACCH program is on the presumed strengths in functioning of individuals as a foundation for learning from and adapting to the environment (Gresham et al., 1999). TEACCH uses formal and informal methods of assessment to determine the amount of intervention and structure needed by the individual. The TEACCH approach includes a focus on the person with autism and development of a program around this person's skills, interests, and needs (Mesibov, 2000).

Just as the cause of autism is unknown, an effective treatment of this disorder has not been established. Many approaches have shown developmental gains with the use of various approaches; however, most approaches lack significant support, warranting further investigation in this area. Research in this area suggests that a highly structured and individualized program is best (Case-Smith, 2000) suggesting that the TEACCH program might be an effective treatment for individuals with autism.

The mission of the TEACCH program is to enable individuals with autism to function meaningfully and as independently as possible in the community (www.teacch.com). This philosophy lends itself well to be used in conjunction with occupational therapy intervention. This is evident as stated in the definition of occupational therapy as the “therapeutic use of self-care, work, and play activities to increase independent function, enhance development, and prevent disability; may include adaptation of task or environment to achieve maximum independence and to enhance quality of life” (Christansen & Baum, 1997). Based on these definitions, the themes and areas of focus for both interventions coincide in the areas of independence, autonomy, use of dynamic approaches unique to each individual, and generalization. An individual’s independence is a primary focus of both occupational therapy and the TEACCH program. TEACCH is a system of organizing the physical environment, developing appropriate activities, and helping individuals of all ages understand what is expected of them and how to function more independently (Van Bourgondien & Schopler, 1996). The use of interventions such as TEACCH or occupational therapy each have the potential to show gains in function and development, improved adaptation, and increase in functional skills. Autonomy is a primary goal of the TEACCH program and occupational therapy. Another similarity between the TEACCH program and occupational therapy is the dynamic nature of the treatments (www.autism-society.org). For example, the TEACCH intervention is modified as the needs and functional status of the individual change. This is also evident in occupational therapy as the patient’s goals continue to change to increase function. Along with this is the fact that with both interventions the ability for a task to be generalized to different environments is not only possible, but also recommended.

The researchers hypothesize that individuals with autism using the TEACCH program will have a lower recorded number of maladaptive behaviors (physical aggression, self-injurious behavior, and vacating) than individuals with autism not utilizing the TEACCH program. It is also hypothesized that children utilizing the TEACCH program will have an increase in the ability to independently complete functional tasks including activities of daily living (self-cares and socialization) and work and leisure activities.

If the hypotheses are supported, it will suggest that the TEACCH program is an effective treatment for individuals diagnosed with autism. Understanding the components of the TEACCH program may lead to the advancement and increased use of the program or development of additional programs for individuals with autism.

METHODS

Subjects

Subjects included four male children diagnosed with autism, residing at a residential treatment center. The ages of the subjects range from 8 to 13. Subjects were matched into two groups, each consisting of two students. All of the participants were already utilizing the TEACCH program during classroom activities. One participant from each group served as the control, while the other participant received the additional TEACCH schedules during the recreational part of the day (3:30pm until bed).

Procedure

All subjects were currently receiving the TEACCH program during classroom periods and activities. The additional use of the TEACCH program for the two subjects occurred from 3:30 until they went to bed. A record review of each subject was conducted to evaluate past maladaptive and functional behaviors. The maladaptive behaviors that were studied included physical aggression, self-injurious behaviors, and vacating. The frequencies of these behaviors were recorded on data sheets used by the residential center, which defined each of the variables. Physical aggression included any contact that may have resulted in injury to another person. Self-injurious behaviors included any act that may have caused physical harm to the individual. Vacating included any time that a participant left the designated area without notifying a staff member. The functional behaviors, including hand washing, face washing, and teeth brushing were measured using checklists completed by the individual's daily caregiver. The number and type of maladaptive behaviors was recorded in one-hour intervals throughout the day. In order to establish a base line, a record review was performed that covered 30 days before the techniques of the TEACCH program were implemented for half of the subjects, during the time from 3:30 to bedtime. This was defined as Period A. The TEACCH program was then implemented for the two students in the experimental group for 30 days during the recreational portion of the day in addition to its use during classroom activities. This was defined as Period B. The frequencies of the subjects' maladaptive and functional behaviors were monitored and recorded for the following thirty days. This length was chosen to allow adequate time for the subject to adjust to the structure of TEACCH and for its effects on behavior to be seen. The data was monitored continuously throughout this time and was reviewed to determine if significant behavioral gains were made to warrant continuation of the TEACCH program for these children and also to possibly begin use with the children in the control group. Data was also collected anonymously from the staff indicating their compliance with implementation of the TEACCH schedule each day.

RESULTS

The data was collected for all four participants for two consecutive periods (A and B) consisting of 30 days each. The frequency of occurrences of each behavior (physical aggression, self-injurious behavior, and vacating) over each time period for each subject was plotted and compared using a curve fit regression line. These can be seen in Figure 1 through Figure 4. Subjects were also matched into pairs containing one participant that received the treatment and one participant that did not receive treatment. The frequency of occurrences of each behavior was also compared between the pairs as shown in Figure 5 through Figure 10.

Before the treatment was implemented, the mean was found for each behavior of all subjects and compared. This statistical measurement was used to ensure similarity between the paired subjects before the treatment was implemented. Data from Subjects 1 and 2 was analyzed and compared, and data from Subjects 3 and 4 was also analyzed and compared. The means for Subject 1 during period A on physical aggression, self-injurious behavior, and vacating are $x = 2.167$, $x = 1.700$, and $x = 0.400$ respectively. The means for Subject 2 of the same time period for physical aggression, self-injurious behavior, and vacating are $x = 2.533$, $x = 1.700$, and $x = 0.733$ respectively. These means for the first 30-day time period suggest that the two subjects were not matched based on typical behaviors (Table 1). The means for Subject 3 for period A for physical aggression, self-injurious behavior, and vacating are $x = 1.067$, $x = 0.767$, and $x = 0.533$ respectively. The means for Subject 4 for the first time peri-

od for the same three behaviors are $x = 2.700$, $x = 2.733$, and $x = 0.433$. The comparison of the means for Subject 3 and Subject 4 shows that this pair was not matched initially either (Table 2).

Table 1 Mean Behaviors of Subjects 1 and 2 for Time Period A

	Physical Aggression	Self-Injurious Behaviors	Vacating
Subject 1*	2.167	1.700	.400
Subject 2	2.533	1.700	.733

*Indicates Subject using the TEACCH program.

Table 2 Mean Behaviors of Subjects 3 and 4 for Time Period A

	Physical Aggression	Self-Injurious Behaviors	Vacating
Subject 3*	1.067	.767	.533
Subject 4	2.7	2.733	.433

*Indicates Subject using the TEACCH program.

Maladaptive Behaviors Between Period A and Period B for Subject 1

In Figure 1a, the curve estimation of the data shows that during period A the physical aggression behavior was decreasing and reached a plateau during period B for Subject 1. The mean for physical aggression for Subject 1 decreased during the time period of the implementation of the TEACCH Program ($x_A = 2.167$, $x_B = 1.533$). Figure 1b shows the curve estimation for the frequency of self-injurious behavior of the consecutive time periods for Subject 1. The initial 30 days of data collection showed an increase in this type of behavior; however during the implementation of the TEACCH Program, the frequency was decreasing. The mean for self-injurious behaviors for Subject 1 decreased during the time period of the implementation of the TEACCH Program ($x_A = 1.700$, $x_B = 1.100$). In Figure 1c, the curve estimation of the data shows the frequency of vacating for Subject 1 also decreased further during the implementation of the TEACCH Program as compared to period A. The mean for vacating behaviors for Subject 1 decreased during the time period of the implementation of the TEACCH Program ($x_A = 0.400$, $x_B = 0.167$).

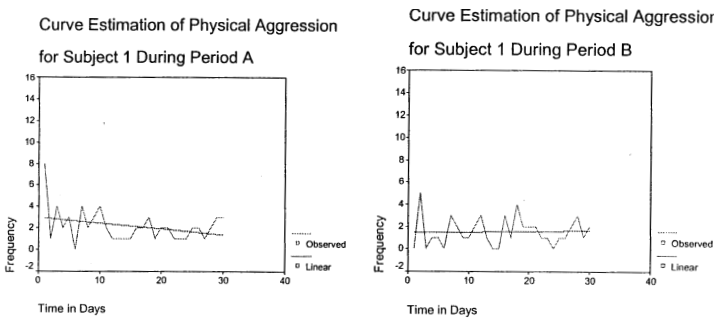


Figure 1a: Curve Estimation of Physical Aggression over Time for Subject 1

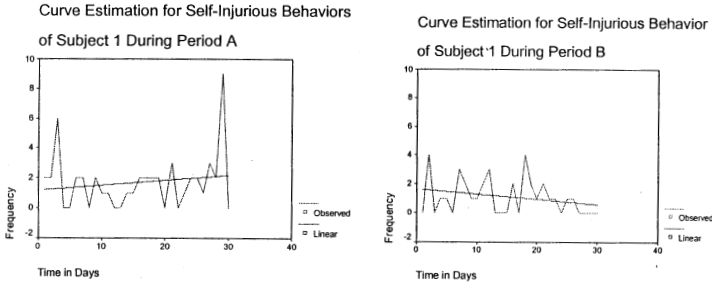


Figure 1b: Curve Estimation of Self-Injurious Behaviors over Time for Subject 1

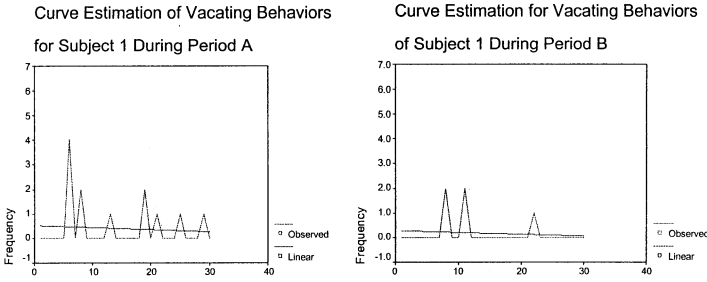


Figure 1c: Curve Estimation of Vacating Behaviors for Subject 1 Over Time

Maladaptive Behaviors Between Period A and Period B for Subject 2

Figure 2a shows the curve estimation for the physical aggression data collected for Subject 2. The curve estimation line in this figure shows a decline in the frequency of behaviors that occurred during both time periods observed. The mean for physically aggressive behaviors for Subject 2 decreased during the time period of the implementation of the TEACCH Program ($x_A = 2.533$, $x_B = 1.167$). In Figure 2b, the curve estimation of the frequency of self-injurious behavior indicates an increase during time period A and no change during the following period of data collection. However, the mean for self-injurious behaviors for Subject 2 decreased between Period A and time Period B ($x_A = 1.700$, $x_B = 1.100$). The curve estimations for vacating for Subject 2, as shown in Figure 2c, indicate an increase in frequency across both time periods. Although the mean for period B is lower than the mean of period A ($x_A = 0.733$, $x_B = 0.467$), the curve estimation shows that the number of occurrences of vacating during period B is increasing for Subject 2 over this time.

Maladaptive Behaviors Between Period A and Period B for Subject 3

The data for Subject 3 is displayed in Figure 3a-3c. Physical aggression for Subject 3 is increasing during both time periods of data collection as indicated by the curve estimation that is shown in Figure 3a. The mean for physical aggression for period A is $x = 1.067$, while the mean for the period B is 1.400. This indicates an increase in the number of physically aggressive behaviors over the two consecutive periods. Self-injurious behavior was increasing during period A and decreasing during Period B, as reflected in Figure 3b. The slope of the

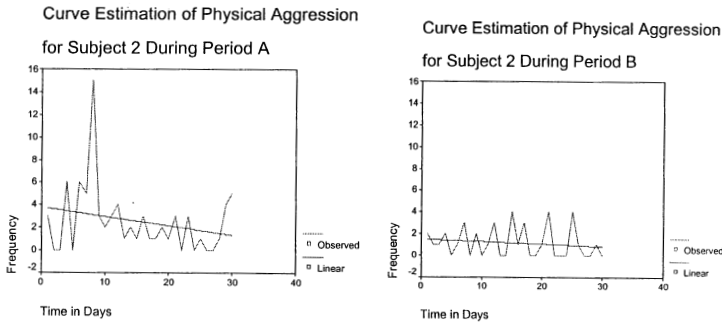


Figure 2a: Curve Estimation of Physical Aggression for Subject 2 Over Time

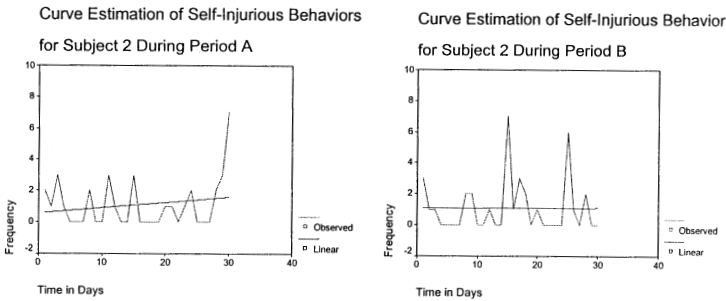


Figure 2b: Curve Estimation of Self-Injurious Behaviors for Subject 2 Over Time

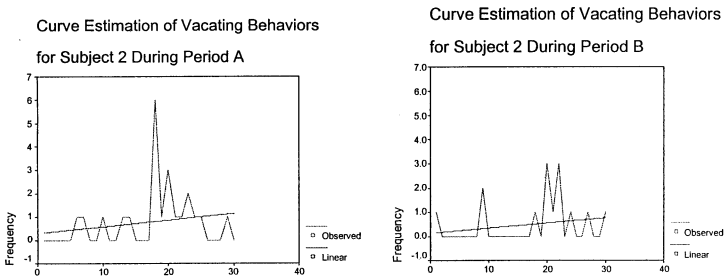


Figure 2c: Curve Estimation of Vacating Behaviors for Subject 2 Over Time

curve estimation is negative indicating a decrease in self-injurious behaviors during Period B; however, the mean for each time period was found to be the same ($x_A = 0.767$, $x_B = 0.767$). Vacating behaviors were decreasing during period A, while they were increasing during Period B as indicated by the curve estimation shown in Figure 3c. The means for each time period; however, did not vary greatly ($x_A = 0.533$, $x_B = 0.676$).

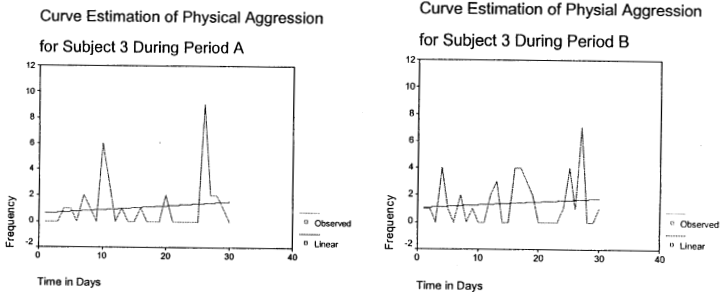


Figure 3a: Curve Estimation of Physical Aggression for Subject 3 Over Time

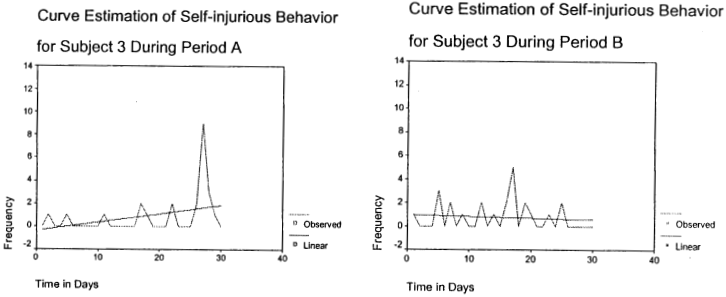


Figure 3b: Curve Estimation of Self-injurious Behavior for Subject 3 Over Time

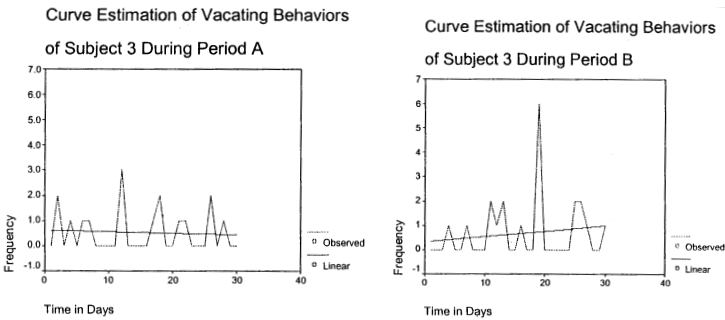


Figure 3c: Curve Estimation of Vacating Behaviors for Subject 3 Over Time

Maladaptive Behaviors Between Period A and Period B for Subject 4

Analysis of the data for physical aggression for Subject 4 is shown in Figure 4a. According to the curve estimation, the frequency of physically aggressive behaviors was found to be declining during period A, while the frequency of these behaviors was increasing during period B of data collection. However, the mean for period B was lower than the mean during period A suggesting a decrease in the behavior over time ($x_A = 2.700$, $x_B = 2.333$). The slope of the curve estimation for each period of data collection for self-injurious behavior is positive, indicating an increase in these behaviors over each time period (Figure 4b). The slope of the curve estimation during period B of data collection is steeper than during period A, suggesting a greater increase in the number of self-injurious behaviors over this 30 days. Means determined for the self-injurious behavior for each time period were $x_A = 2.733$ and $x_B = 2.567$. The curve estimation indicates that vacating behaviors for Subject 4 were decreasing during time period A, while they were increasing during Period B (Figure 4c). The mean of the vacating behavior during Period A was $x_A = 0.433$, and the mean for Period B was $x_B = 1.000$, also indicating an increase in the behaviors over time.

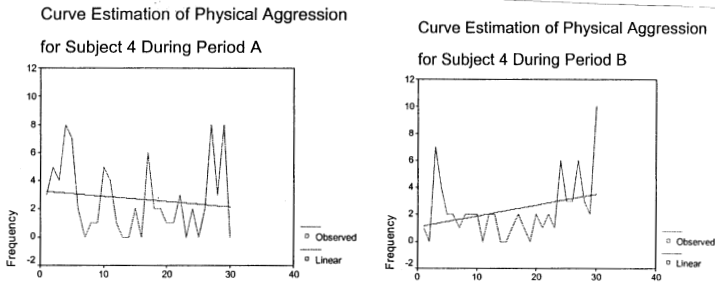


Figure 4a: Curve Estimation of Physical Aggression for Subject 4 Over Time

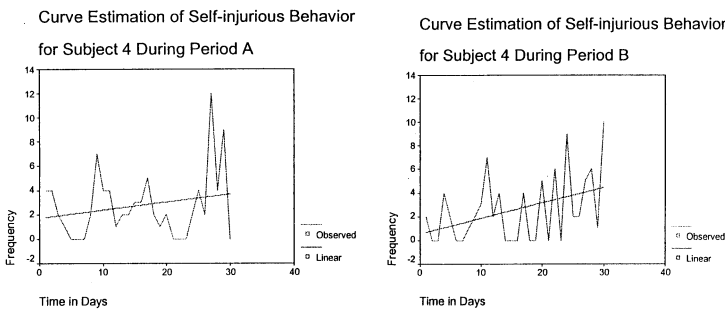


Figure 4b: Curve Estimation of Self-injurious Behavior of Subject 4 Over Time

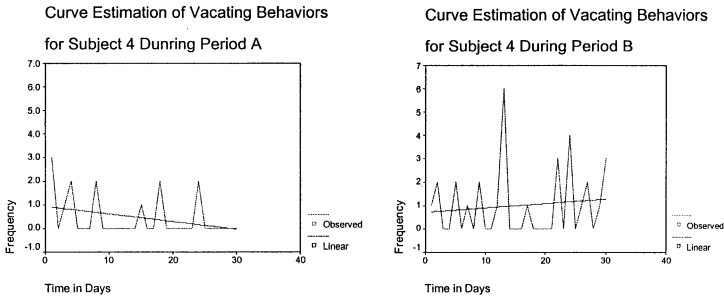


Figure 4c: Curve Estimation of Vacating Behaviors for Subject 4 Over Time

Comparison of Maladaptive Behaviors During Period B for Subject 1 and Subject 2

Data collected during period B for Subject 1, who received the additional TEACCH Programming during time period B, was compared to Subject 2, who did not (Table 3). The curve estimation for physical aggression of Subject 1 during Period B shows a fairly horizontal slope, indicating a plateau in these behaviors (Figure 5).

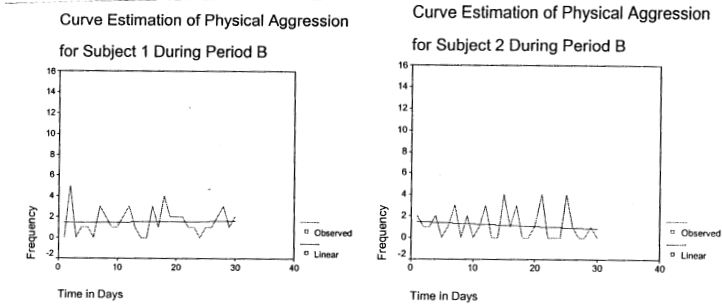


Figure 5 Curve Estimation Comparison of Physical Aggression Of Subject 1 and Subject 2 During Period B

The data collected; however, indicates that Subject 2 had a lower mean number of occurrences of physical aggression than Subject 1 ($x_1 = 1.533$, $x_2 = 1.167$) during this time. In comparing the data for self-injurious behavior between Subject 1 and Subject 2, the curve estimation for Subject 1 shows a steeper negative slope indicating a faster decrease in behaviors during Period B (Figure 6). The calculated means of self-injurious behaviors for these subjects were; however, the same ($x_1 = 1.100$, $x_2 = 1.100$).

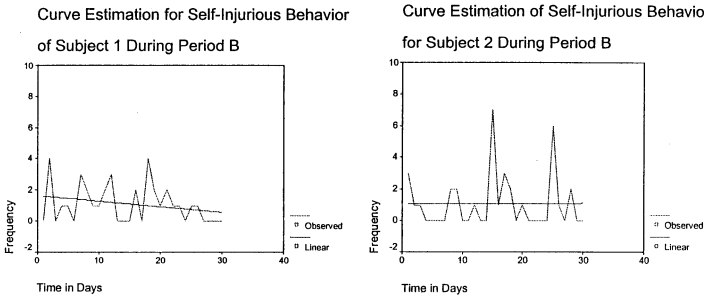


Figure 6 Curve Estimation Comparison of Self-injurious Behavior Of Subject 1 and Subject 2 During Period B

Table 3

Mean Behaviors for Subject 1 and Subject 2 during Time Period B

	Physical Aggression	Self-Injurious Behaviors	Vacating
Subject 1*	1.533	1.100	.167
Subject 2	1.167	1.100	.467

*Indicates Subject using the TEACCH program.

Curve estimation analysis of vacating behaviors of Subjects 1 and 2 during time period B can be seen in Figure 7. Subject 1 showed a negative curve estimation slope indicating a decrease in the frequency of vacating behaviors; while, the curve estimation slope for Subject 2 is positive showing an increase in vacating over time period B. The mean for vacating behaviors for Subject 1 was lower than the mean for Subject 2 during Period B ($x_1 = 0.167$, $x_2 = 0.467$).

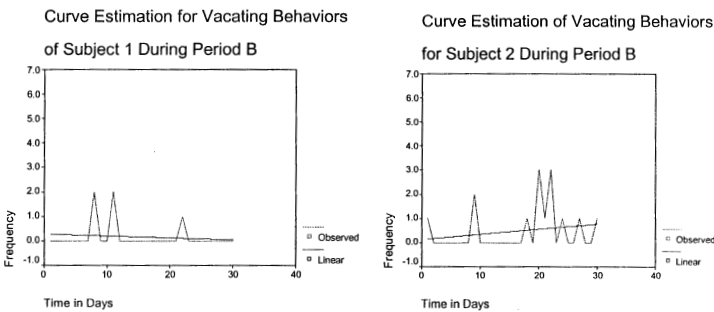


Figure 7 Curve Estimation Comparison of Vacating Behavior Of Subject 1 and Subject 2 During Period B

Comparison of Maladaptive Behaviors During Period B for Subject 3 and Subject 4

The means of the frequencies of each behavior was also calculated and compared between Subject 3 and Subject 4 for period B (Table 4).

Table 4

Mean Behaviors for Subject 3 and Subject 4 during Time Period B

	Physical Aggression	Self-Injurious Behaviors	Vacating
Subject 3*	1.400	.767	.667
Subject 4	2.333	2.567	1.000

*Indicates Subject using the TEACCH program.

Review of Table 4 reveals that Subject 3, who received the additional TEACCH Programming had a lower mean for each behavior observed than Subject 4, who received no additional programming. In comparing the curve estimation for physical aggression of the two subjects (Figure 8), examination yields a greater positive slope for Subject 4 indicating a greater increase in physically aggressive behaviors than Subject 3. The mean for physically aggressive behaviors for Subject 3 was lower than the mean for Subject 4 during Period B ($x_3 = 1.400$, $x_4 = 2.333$).

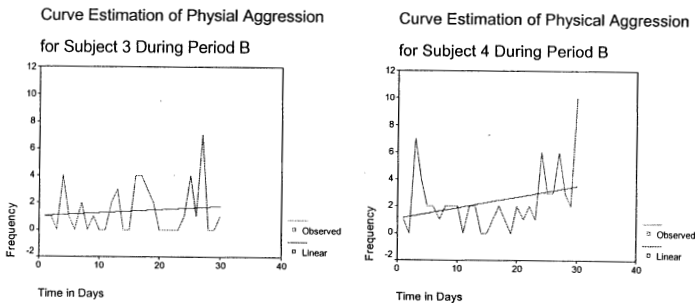


Figure 8 Curve Estimation Comparison of Physical Aggression for Subject 3 and Subject 4 During Period B

The curve estimation slope for self-injurious behaviors for Subject 3 is negative, while the slope for Subject 4 is positive (Figure 9). This analysis shows that the self-injurious behaviors of Subject 3 are decreasing while those of Subject 4 are increasing during Period B. The mean for self-injurious behavior for Subject 3 was lower than the mean for Subject 4 during Period B ($x_3 = 0.767$, $x_4 = 2.567$).

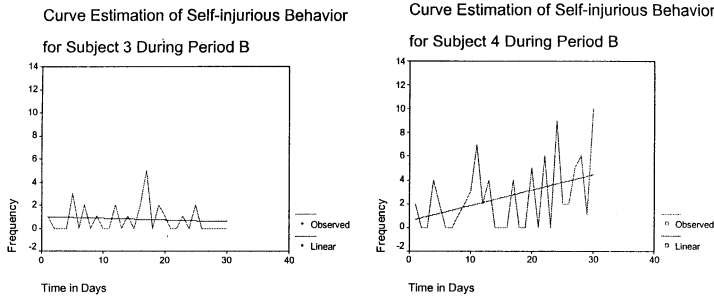


Figure 9 Curve Estimation Comparison of Self-injurious Behaviors for Subject 3 and Subject 4 During Period B

Figure 10 is a graphical representation of the comparison of vacating behaviors between Subject 3 and Subject 4. This curve estimation shows that Subject 4 has a greater number of vacating incidents than Subject 3 throughout Period B. The mean for vacating behavior for Subject 3 was lower than the mean for Subject 4 during Period B ($x_3 = 0.676$, $x_4 = 1.000$).

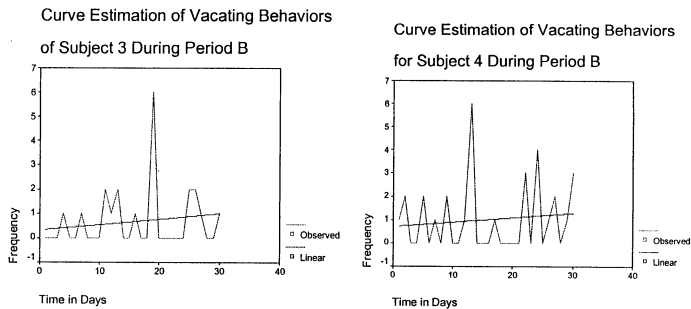


Figure 10 Curve Estimation Comparison of Vacating Behavior For Subject 3 and Subject 4 During Period B

Functional Behaviors

Percentages were used to analyze the data obtained from Subjects for independence in functional behaviors. The baseline data collected for period A of data collection of the functional tasks is shown in Table 5.

Table 5

Percentage of Independent Completion of Functional Tasks during Period A

	Hand Washing	Face Washing	Teeth Brushing
Subject 1*	83.3%	36.6%	46.6%
Subject 2	23.3%	0	10.0%
Subject 3*	83.3%	76.7%	90.0%
Subject 4	86.7%	53.3%	80.0%

*Indicates Subject using the TEACCH program.

Table 6 shows these figures for each Subject during the implementation of the TEACCH program.

Table 6

Percentage of Independent Completion of
Functional Tasks During Period B

	Hand Washing	Face Washing	Teeth Brushing
Subject 1*	63.3%	26.7%	53.3%
Subject 2	60.0%	23.3%	36.7%
Subject 3*	86.7%	90.0%	90.0%
Subject 4	83.3%	40.0%	73.3%

*Indicates Subject using the TEACCH program.

Analysis of this data shows that Subject 1 and had a higher percentage of independent completion of functional tasks including hand washing, face washing, and teeth brushing during Period B, than did Subject 2. Similarly, Subject 3 also showed a higher percentage of completion of these tasks using the TEACCH program than Subject 4.

Further analysis of this data for the subjects using the additional TEACCH programming, shows that Subject 1 decreased in independent completion of hand washing and face washing between Period A and Period B, whereas Subject 3 increased in the percentage of independent completion of each functional task over the entire length of the study.

Percentage of Schedule Completion

Finally, the compliance, percentage of completion of the daily schedule, during implementation of the TEACCH schedules for Subject 1 and Subject 3 by the Chileada staff was recorded. The compliance was recorded for 8 days for Subject 1 during the implementation phase of the study yielding a 38.0% compliance rate. The compliance was recorded 15 days for Subject 3 during the implementation phase of the study, yielding a 45% compliance rate.

DISCUSSION

The findings of this research are inconclusive. When comparing data from Subject 3 to data from Subject 4, the hypothesis that extended use of the TEACCH program will decrease maladaptive behaviors was supported. This hypothesis however was not supported when comparing data from Subject 1 to data from Subject 2. Numerical analysis of the functional behaviors of Subject 3 supports the hypothesis that the participants utilizing the TEACCH program will have an increase in the ability to independently complete functional tasks. However, this hypothesis is not supported by data collected for Subject 1. One possible explanation for this phenomenon is the nature of the spectrum disorder that is Autism. As discussed previously, these symptoms vary per individual and as a result the effective treatments needed are just as unique.

Due to the finding that the subjects were not exactly matched during the initial baseline data period, expansion of our hypotheses was warranted. Further analysis yielded that when comparing data for Subject 1 over both time periods, the hypothesis that implementation of the TEACCH program will result in a decrease in maladaptive behaviors was supported. However, this hypothesis was not supported by data collected for Subject 3. In other words,

Subject 1 showed a decrease in maladaptive behaviors when compared to his established baseline, while Subject 3 did not.

Increase in independence of functional behaviors showed a similar pattern. Subject 3 showed an increase in performance over time following extended use of the TEACCH program, while Subject 1 did not. These results could be due to the fact that combinations of traits exhibited by individuals with autism vary significantly and may require different treatments or combinations of treatments to effectively address all problem areas (Ball, 1999). Due to the differences in behaviors studied, it can be suggested that different approaches to treating these areas may be needed for maximal outcome. Another explanation for the conflicting data for the independence in functional behaviors is that mini-schedules for each task were not used. Certain individuals, depending on the cognitive and functional levels, sometimes need smaller schedules for each task, in addition to the main schedule, that break the task into single steps for higher overall performance.

Inconsistencies in the implementation of the TEACCH program realistically could have had a large impact on the outcome of the data. Subject 1 only had a 38% compliance rate of implementation of the TEACCH program throughout the treatment phase of the study, while Subject 3 only had a 45% compliance rating during this phase. The philosophy of the TEACCH program focuses on providing consistent structure for the individual based on daily expectations. When schedules are not provided on a day-to-day basis this may contribute to confusion in the child with autism and could lead to inconsistencies in results.

Some of the data collected supports findings of previous research that the use of visual schedules reduces behavioral problems (Panerai et al, 1998). The data collected also suggests support for extended use of treatment for increasing developmental skills, such as functional self-care skills (Ozonoff & Cathcart, 1998). The conflicting data may also support the need for more individualized treatment planning that corresponds with the uniqueness of the individual. The data collected showed that the TEACCH schedules were helpful in improving behaviors in different areas for different participants. Meaning that different approaches may have to be utilized to target different behaviors or tasks. In relation to other studies done in this area, this research also supports further analysis of treatment approaches for this population, as a consensus has not yet been reached.

Providing visual schedules to individuals with autism may be an approach that can be used to support their need for a more easily processed stimulus. This can help some individuals function more appropriately in everyday activity. Although the TEACCH program may not ameliorate all the areas of concern, it can be an adjunct to further treatment. By aiding individuals with autism to further understand their environment, occupational therapy practitioners can provide a foundation for further progress.

LIMITATIONS

The most significant limitation that may have affected the data includes inconsistent implementation of the TEACCH schedules. TEACCH philosophy is based on providing consistency to the individual with autism and when schedules are not utilized consistently, this can decrease the efficacy of the program. Another significant limitation not only in this study, but in similar studies of this population as well, is the small sample size. Due to the vulnerability of the population, as well as the small number of available participants, it is difficult to find a large sample. These small numbers limit the statistical analyses available to

evaluate the data. High staff turnover at Chileda was also noted during the length of the study. Many new staff was being trained during data collection times. This may have affected the participants' behaviors, as unfamiliar staff does not have a rapport established with the participants. The subjects were not initially matched between the pairs, which affected the ability to compare subjects to one another following the implementation of the TEACCH program. Difficulties in comparisons were also due to the individual manifestations of the characteristics within each subject diagnosed with autism. The use of all male subjects also decreases the generalizability of the findings to the female population of individuals with autism.

Some recommendations for future work with this population would include using a larger sample size if possible. Further research in this area is still warranted, as an effective treatment for this population is yet to be identified, however statistical analysis is difficult with extremely small sample sizes. Although it is difficult to control for confounding variables it may be beneficial for future researchers to use limited number of staff with more experience to promote consistency in behavior program implementation. To account for the individuality of symptoms that present in the individual with autism is difficult, therefore it may be most effective to look at individuals in a single case study design. Also, other treatment approaches also need to be evaluated and one recommendation for future work in this area would be to study and compare a control group with one group utilizing the TEACCH program and one group utilizing another alternative treatment to this unique diagnosis. This design would allow for the analysis of multiple variables, looking at the best possible treatment for the individual with autism.

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