

Intellectual, Academic, and Psychosocial Self-Care Achievements Among Children with Autism

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ABSTRACT

Progress in intellectual, academic and psychosocial-self-care achievements among 30 children with autism (CWA) within five years (2006 to 2010) was determined utilizing inter-correlations through Pearson r . Univariate repeated-means analysis was also used to determine if scores significantly differed from one another. Another objective was to find out if there were significant differences in intellectual, academic and psychosocial self-care achievements among CWA in terms of: a) the type of SPED tutorials (i.e., with or without behavior coaching), b) school placement (i.e., big or small school), and c) the type of behavioral intervention (i.e., occupational therapy, applied behavior analysis or both). To determine this, repeated-measures ANOVA was used. Results indicated that there were significant increases in the CWA's intellectual, academic and psychosocial-self-care achievements within five years while there were no significant differences among the selected factors mentioned in terms of the CWA's intellectual, academic and psychosocial-self-care achievements except for shift in placement from small to big school. Implications and recommendations based on the results are forwarded.

Keywords: *achievement, school placement, intervention, assessment, children with autism*

How well children with autism (CWA) perform in school, and behave and relate with other children and persons is often an outcome of child-related factors (e.g., age, disability, degree of disability), and several intervention efforts (Leekam, Prior & Uljarevic, 2011). Parents and the family, special education specialists, medical practitioners, providers of programs and services would claim that they are a force to contend with as they get more involved with the overall goal-setting and implementation of interventions for the CWA.

In many cases, however, parents make the final decision as far as their children are involved, and exert more effort to provide for their needs. Similarly, every parent of a child with special needs wishes his/her child to live comparably with his non-disabled peers. This is the main reason why parents of CWA unceasingly consider all kinds of interventions, medications, services and programs for their children (Altiere & von Kluge, 2009).

At some point then, parents ask: "Are we putting our money, time and effort on the most effective intervention?"; "How do we know which one or what combination is appropriate?"; "What other factors can be considered for children to fully achieve in the different developmental areas?" These are some questions this study aimed to answer.

Many stereotypes have been attributed to CWA but most often—though not in all cases—autism comes with developmental delays as manifested by qualitative impairments in communication and social interaction (Bolte, Westerwald, Holtman, Freitag & Poustka, 2011). There is also an observed restricted, repetitive and stereotyped pattern of behaviors, interests and activities which affect the life of CWA in

areas such as activities of daily living, learning, career development and social life (Kumar, Kumar & Singh, 2010); thus, compared to typically developing children, CWA have unique needs, abilities and achievements in three major areas: intellectual, academic and psychosocial self-care.

Intellectual Needs, Abilities and Achievement

Intellectual achievements of individuals are influenced by several factors: genetics, breastfeeding done by mothers, presence or absence of important minerals in the body, nutrition, type of home environment and early intervention (Grasso, 2002; McDevitt & Ormrod, 2007). Many studies have been conducted about the human's intellectual capacity and among these are those that have focused on some special groups like CWA (Papalia, Olds & Feldman, 2009). Mayes and Calhoun (2003), using the Stanford-Binet-IV and the Wechsler Intelligence Scale for Children (WISC) III, obtained CWA's cognitive profiles. They observed that CWA have relatively strong rote learning and visual skills (i.e., matching, spatial relations and short-term memory) but poor comprehension and analytical skills. Using the WISC-III, the same authors observed that CWA have good lexical knowledge, and relatively strong recall of facts, definition and categorical terms. Still, they have relatively low verbal comprehension; thus, low social reasoning as well. In the area of block design and object assembly, some CWA have greater visuo-spatial and visuo-motor manipulative skills while others have graphomotor weaknesses making it difficult for them to write. In general, CWA have higher non-verbal intelligence quotient (IQ) compared to verbal IQ. Nevertheless, verbal IQ increases over time as measured by WISC-III and

Stanford Binet IV, lessening its gap with non-verbal IQ.

Academic Needs, Abilities and Achievement

Mayes and Calhoun (2003) also observed some strengths and milestones in the area of academics using Stanford-Binet-IV and WISC-III. According to their findings, some CWA did well in the areas of reading comprehension, spelling, math and writing. Some of their participants, nonetheless, failed to finish the tests in areas of reading comprehension and written expression indicating difficulties.

Kurth and Mastergeorge (2010), utilizing various instruments, found that CWA who were in inclusive settings had higher scores in reading, writing and mathematics than those in self-contained settings. Inclusion that refers to the placement of children with special needs in general education classes, therefore, is associated with significant increases in CWA's academic performance or achievement.

Psychosocial Needs, Abilities and Achievement

Bolte and his colleagues (2011), using the Social Responsiveness Scale (SRS) and the Social and Communication Disorders Checklist (SCDC), observed that CWA have major difficulties in interacting and communicating with others. Thus, CWA need to learn many related things like social rules and propriety with regards to their interaction with many people (Berney, 2009). Matson, Neal, Fodstad and Hess (2009) also found that CWA's stereotypical behaviors are related to the level of interaction with adults and peers (i.e., the lesser the interaction, the more CWA display undesirable behaviors). Interaction alone, however, is not enough. Children with autism must interact with good companions who can help them

develop self-acceptance and later on self-confidence. This will help them succeed in their chosen endeavors (Dizon, Bustos & Gomez, 2009).

Intervention Services and Programs for Children with Autism

Behavioral and academic concerns of children with autism are usually addressed by a multidisciplinary team of professionals (Carandang, 2009). Speech pathologists provide speech and language communication training, and occupational therapists and SPED teachers help them develop and improve psychosocial and self-help skills. Developmental pediatricians diagnose suspected CWA and thereafter refer them to needed support interventions like occupational therapy (OT), physical therapy (PT), applied behavioral analysis (ABA), SPED tutorials, etc. Special education specialists and diagnosticians assess what the child can and cannot do in the different developmental areas. They then design individualized educational plans consisting of needed curricular and instructional programs, support system, materials, equipment and facilities.

It is important that assessment and intervention services are provided the earliest time possible to CWA and even those suspected of having autism so as to help them mitigate the impact of their condition (Arick, et al. 2003; Reed, Osborne & Corness, 2006). Such services must also aim for the CWA to be independent to the point that they can do things on their own and rely less on interventions in the long term (Hume, Loftin & Lantz, 2009). Existing intervention centers and also professional assessment/evaluation centers in the Philippines are mostly privately owned and operated, and not all provide specialized individualized educational programs.

SPED Tutorials and Behavior Coaching

One-on-one support services like SPED tutorials and behavior coaching provided by SPED teachers or SPED-trained professionals address both educational remediation and the improvement of psychosocial skills and competencies consistent with the normalization perspective (Dizon, et al. 2009).

Special education tutorials are usually conducted in centers, in schools and even at home while behavior coaching is implemented by professionals or family members at home and in the community.

Behavioral Interventions

There are many interventions for managing CWA's behaviors but the two most popularly used are ABA and OT. In some studies, parents observed that their children's well-being improved after ABA and OT were applied (Altiere & von Kluge, 2009; Grindle, Kovshoff, Hastings & Remington, 2009). Improvements were observed especially along social interaction, expressive speech, and adaptive language concepts (Arick, et al. 2003).

The goal of ABA is to reinforce desired behaviors and extinguish undesirable ones (Ormrod, 2004). The Discrete Trial Teaching (DTT), which makes use of systematic one-on-one instruction between a teacher and a student, is an example of one of the most frequently-used methods in ABA (Steege, Mace, Perry and Longenecker, 2007).

The goal of occupational therapy as an intervention is to address behavioral, fine-motor and play concerns of children with special needs (Ben-Sasson, Cermak, Orsmond, Carter & Fogg, 2007). Rodger, Ashburner, Cartmill and Bourke-Taylor (2010) also suggested that occupational therapists advise environmental

modifications (e.g. lessen clutter, increase speaker's voice, etc.) that can help lessen the burden on CWA's senses. They may also assist children and their families in solving problems and learning various self-management strategies in addressing occupational issues like establishment of functional routines, self-regulation of behavior, transitions between tasks and sensory overload.

School Placement

School placement can either be *big* or *small* where the latter can accommodate a limited number of students mostly at the preschool levels. They are sometimes called neighborhood or community schools as they cater to students within the same area. Big schools, on the other hand, have more resources, can accommodate more students, and are more likely to be inclusive. School settings are said to be inclusive when children with special needs are accommodated in the general education classrooms on the basis of chronological age regardless of their disabilities and limitations (Dizon, Bustos, Ealdama, Echavia, Gomez, Oael, Tantengco & Vidal, 2011). Kurth and Mastergeorge (2010) observed that school placement is a significant factor in helping CWA improve their academic performance. Specifically, CWA's academic achievements are highly associated with inclusive settings. Parents also expressed the same thing when asked how immersion in an inclusive environment helped their CWA (Schwartz, Sandall, McBride & Boulware, 2004).

Not all schools, however, accept children with special needs through the inclusion program. Some children are mainstreamed and others are integrated. A mainstream program refers to placement in the general education classes with provision of support services or

schemes such as shadow teaching and pullout instructional or therapeutic one-on-one or small-group sessions. In an integration program, children with special needs are placed in SPED classes and then on scheduled times, are joined with regular peers in academic lessons and co-curricular activities (Dizon, Mercado & Sacris, 2000).

Placement in mainstream and integration programs—more than just regular-class socialization—also addresses individualized educational and psychosocial priorities for children with special needs. In shadow teaching, a SPED teacher handling a child attends to behavior management, social skills management, curricular and instructional modifications and collaboration with the general education teachers, ensuring his/her success in the general education class (Dizon, Bustos, Cabutihan, Ealdama, Echavia, Gomez, Manansala, Oael, Rodas, Sandoval, Vidal, 2008).

Educational assessment must be done to determine the child's developmental levels and based on these, the placement and interventions for him/her. This service is provided by educational professionals whose goal is to suggest appropriate educational settings and instructional priorities (Xenitidis, Paliokosta, Maltezos & Pappas, 2007). This facilitates clear understanding of the CWA: his/her needs, achievement levels in various areas, and developmental priorities that need to be met, and purposive intervention.

RESEARCH AIMS

Utilizing children's intellectual, academic and psychosocial-self-care achievement test ages drawn from results of standardized tests and scales in a five-year span, this study specifically focused on determining: 1) whether there are

significant changes in intellectual (IA), academic (AA) and psychosocial self-care (PSA) achievements among children with autism (CWA) yearly across five years; and, 2) whether there are significant differences across five years in IA, AA and PSA among the following variables, namely: a) types of SPED tutorials (i.e. with or without behavior coaching), b) school placement (i.e. big school or small school or small to big school shift), and c) types of behavioral interventions (i.e. occupational therapy/OT, applied behavior analysis/ABA or OT in combination with ABA).

METHODOLOGY

Research Design

In this research, a longitudinal-retrospective study design (Burchinal, Nelson & Poe, 2006) was utilized in determining the intellectual, academic and psychosocial-self-care achievements of 30 children with autism as rated by their parents within a five-year span.

Respondents

Thirty parents of children with autism residing in Metro Manila, Philippines (Quezon City, Makati City and other surrounding cities) participated in this study. Their children underwent psycho-educational assessment with a Special Education diagnostician/specialist every year from 2006 to 2010. Twenty-six of the subjects were boys and four were girls with overall mean ages of 7.8 for Year 1 (2006) and 11.7 for Year 5 (2010). In cases where the CWA lived with both parents, either the mother or the father was asked to participate.

Research Instruments

A researcher-designed questionnaire and the recorded intellectual and academic profiles based on psycho-

educational assessment data were used in the study.

Each parent-participant was asked to answer the questionnaire enabling him/her to enumerate the child's interventions every year from 2006 to 2010 with provision of space for combinations of interventions their CWA might have had. Open-ended questions were found at the end of the questionnaire to allow the participants to express their thoughts and insights into their children's school placement and interventions.

Individual informal follow-up interviews were conducted only in cases where clarifications regarding the participants' answers to the questionnaire items were needed.

The data for the intellectual and academic achievement were culled from standardized test results administered to the CWA annually for five consecutive years in an officially-accredited private psycho-educational assessment clinic. All the tests and the scale used as bases for data yielded test ages in years and months (e.g., 7.4 years old is 7 years and 4 months old). Formal written permission to access assessment results was asked from the parents and the SPED diagnostician/specialist of the clinic.

Intellectual achievement test ages were culled from results of the Stanford-Binet Intelligence Scales Fourth Edition (SBIS-IV) for five years (2006 to 2010). The SBIS-IV is a test composed of four areas namely: Verbal Reasoning, Visual/Abstract Reasoning, Quantitative Reasoning, and Short-Term Memory (Youngstrom, Glutting & Watkins, 2003). There are three to four subtests in each area. In the Vocabulary subtest under Verbal Reasoning, the examinees: a) named objects, animals and sights shown in pictures, and b) defined words presented to them. In Verbal Absurdities, they: a) picked out from three given

options a picture they thought was funny or silly, and b) explained what was silly, funny or wrong about a given picture. Under Visual/Abstract Reasoning, the subtests given to this group of subjects were Pattern Analysis and Copying for younger children and Pattern Analysis and Matrices for older children. In the Pattern Analysis and Copying subtests, examinees replicated visual patterns through block manipulations following actual demonstration and by looking at arrangements shown in cards using blocks and cubes as materials. In the Matrices subtest, examinees were shown figures with missing elements and had to complete them by choosing from options. Though SBIS-V is a more recent version of the SBIS-IV, CWA subjects in this research have undergone assessment utilizing the latter as it is easier and less time-consuming to administer especially for CWA who have behavioral concerns like non-compliance, inattention and irritation (Becker, 2003).

Academic test ages were taken from results of the Young Children's Achievement Test (YCAT). According to Turner (2006), the YCAT is a test given for children ages four years to seven years and 11 months old. It is composed of five ability areas (i.e., General Information, Reading, Mathematics, Writing and Spoken Language). Most of the items are given verbally while in the latter parts of the Writing and Math tests, the examinees are asked to use paper and pencil to answer. In this research, the YCAT was given to CWA with the same ages covered by the test and also to CWA who were older (up to nine years old), but due to their developmental disabilities, performed within the age ranges indicated for the said test.

In this research, the Wechsler Individual Achievement Test-Second Edition (WIAT-II) was given to CWA ten

years and older. The WIAT tests four ability areas namely: Writing, Mathematics, Written Language and Oral Language (Choate, 2009) which are further specialized into nine subgroups. Among them, four are objective and non-analytical type tests (i.e., Word Reading, Spelling, Pseudoword Decoding and Numerical Operations) while five are analytical and comprehension tests (i.e., Reading Comprehension, Math Reasoning, Listening Comprehension, Oral Expression and Written Expression).

Data for the psychosocial-self-care achievement were taken from results of the Vineland Social Maturity Scale (VSMS) – also annually conducted for five consecutive years. This scale is a non-projective instrument consisting of 77 items (Holroyd, 1966). Items are grouped into these areas: socialization, communication, locomotion, occupation, and self-care: eating, dressing and grooming.

Data Analysis

As suggested through a study done by Burchinal and his colleagues (2006), inter-correlations across years of test ages for each variable were determined using Pearson *r*. Univariate repeated-means analysis was used to gauge if these scores were significantly different with one another. Repeated-measures ANOVA was used to see if there were significant changes across five years in the subjects' intellectual, academic and psychosocial-

self-care achievements in each of the selected factors.

RESULTS AND DISCUSSION

Intellectual, Academic and Psychosocial-Self-Care Achievements Across Five Years

Inter-correlation was done across five years for each variable to determine if they were interrelated. Results show that all scores across the variables were highly –correlated to one another. For intellectual achievement, correlations ranged from $r = .888-.976, p < .05$. Scores for academic achievement were highly-correlated at $r = .95-.99, p < .05$ across five years. Lastly, measures of psychosocial-self-care achievement had correlation values ranging from $r = .95-.99, p < .05$. This shows that these achievements were correlated as expected from repeated-measures assessment.

The longitudinal design is known for its features wherein points closer together are more highly correlated than distant points apart (Burchinal, et al. 2006). This observation held true in this study given that the lowest correlation was between two distant points - Year 1 (2006) and Year 5 (2010).

Changes of scores of each variable were found to be significant across five years. Table 1 shows the means and standard deviations of scores for each variable across time.

A univariate repeated-means analysis was conducted to assess whether there

Table 1. Univariate statistics for variables in analysis

Variables	N	Year 1	Year 2	Year 3	Year 4	Year 5
Intellectual	30	6.28	7.04	7.90	8.28	9.14
Academic	30	5.60	6.40	7.29	8.06	8.63
Psychosocial Self-Care	30	5.21	6.03	6.86	7.62	8.50

were differences between the score levels in intellectual achievement. Results indicated that subjects' level of intellectual achievement did differ across five years, $F(4, 26) = 49.69, p < .05$.

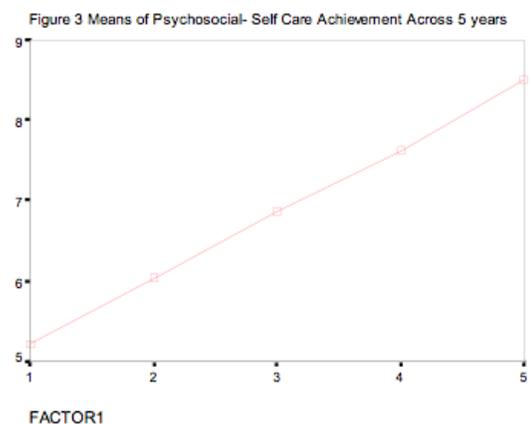
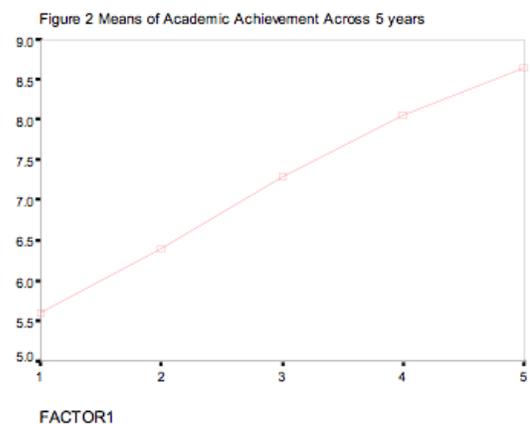
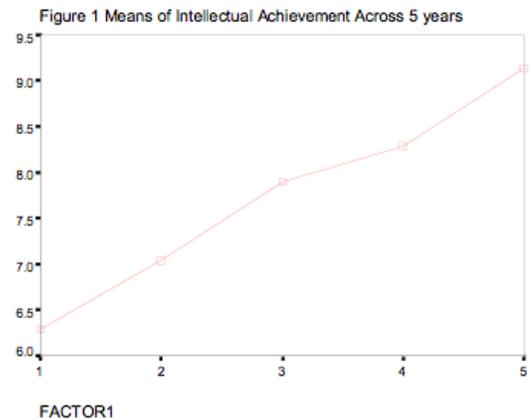
Among most typically-developing children, intellectual achievement improves with age (Papalia, et al. 2009). Results of this study (see Figure 1) also showed that CWA's mean intellectual achievement ages improved steadily across five years (Time 1 to Time 5). This is similar to the findings of Dietz and her colleagues (2007) where CWA's intellectual profiles were shown to have improved with age with some showing even higher than the average rate among typically-developing children.

Academic achievement changed across time, $F(4, 26) = 38.96, p < .05$ as well. Figure 2 shows improvement in mean academic achievement ages every year from 2006 (Time 1) through 2010 (Time 5).

Academic achievement or school performance may progress with the influence of direct teaching and other teaching methods often notwithstanding lags in intellectual achievement/profile (Kurth & Mastergeorge, 2010). The rate at which an individual progresses in academic achievement, however, may be attributed to his intelligence level (Mayes & Calhoun, 2003) which, in turn, is also affected by both genetic and environmental factors (Grasso, 2002; McDevitt & Ormrod, 2007).

A significant change was observed for psychosocial-self-care achievement, $F(4, 26) = 154.37, p < .05$. Figure 3 shows that mean psychosocial-self-care achievement ages improved significantly as number of years increased.

Children, in general, improve in terms of maturation (under which psychosocial and self-care areas belong) as they grow



older. This can be attributed to better awareness of persons, things and happenings around them and for children with autism and developmental delays, this may be possible through provisions of training and opportunities for contextual learning (Rodger, et al. 2010).

Intellectual Achievement and Selected Factors

Using repeated-measures analysis of variance to determine whether there were significant differences between intellectual achievement and each selected factor, only the type of school placement was found to be significant. No significant differences were found regarding the effects of the presence of behavioral coaching in SPED tutorials and the type of behavioral interventions (i.e., OT and/or ABA). Table 2 shows the *F*-ratio and *p*-values for each factor.

For school placement, there were no significant differences in intellectual achievement among those placed in big or small schools except for those placed in small schools in their first year of schooling, and then in big schools thereafter. A comparison of the latter group's Year 1 and Year 2 intellectual achievement for school placement registered a significant difference, $F(4.56, 54.69) = 2.52, p = .044$. This result is supported by Dietz and his colleagues (2007) who claimed that intellectual functioning of CWA increase due to their brain's plasticity making it possible for early learning and progress just like among their typically-developing peers.

This significance might be attributed to the changes in interventions, approaches, resources and activities available to the CWA following the shift from small to big school placement. The gradual exposure to more formal and structured lessons and set-up and other

facilities in the big school from play and informal lessons in the small school might have helped in the significant improvement in intellectual achievement. This, combined with various SPED supports usually available/accessible in big schools with SPED programs, might have been a significant contributing factor. Some of SPED supports that are usually available in general education classrooms in big schools include individualized instruction and utilization of appropriate materials through the instructional schemes such as pullout and shadow teaching. As previously explained, both schemes aim to give attention to what the CWA needs at a given time (e.g., behavior management, modification of lessons or provision of specialized materials) for successful learning.

Placement in the big schools might have also provided CWA with much-needed intellectual stimulation. The number of students and teachers in the big schools might have given the CWA adequate/rich opportunities for increasing analytical and verbal skills through small-group discussions, friendly competitions and other activities that encourage the use of cognitive processes (e.g., recognition, comparison, discrimination, discuss). Being with regular peers might have also helped the CWA in imitating them think of, process and communicate information better. These activities might not have been possible in the small schools due to the

Table 2. Repeated Measures Analysis of Variance for Intellectual Achievement

EFFECT	<i>MS</i>	<i>Df</i>	<i>F</i>	<i>P</i>	Greenhouse	Huynh-Feldt
Time x SPED tutorials	.34	2.03	.25	.78	.50	.58
Time x School placement	2.64	4.56	2.52	.044	.570	.68
Time x Behavioral intervention	1.26	4.06	.96	.44	.508	.622

smaller number of students and limited space. Students might have also lacked the opportunities to develop higher-level learning as their teachers might have given them too much assistance and attention.

Children with autism in this study attended occupational therapy (OT) in accredited therapy centers in Metro Manila while applied behavior analysis (ABA), a behavior intervention program, was conducted at home. Whether CWA attended OT, ABA or OT and ABA combined, no significant differences were found as far as intellectual achievement was concerned.

The same was true for CWA who were provided with special education (SPED) alone and those with SPED tutorials in combination with behavior coaching. These results may be attributed to the fact that intellectual achievement is mainly dictated by one's physiological, neurological and psychological make-up - and does not rely much on external interventions (Papalia, et al. 2009).

Academic Achievement and Selected Factors

Repeated measures Analysis of Variance showed that the factors in the study had no significant effects on CWA's academic achievement. Table 3 shows the *F*-ratio and significance of these factors.

In terms of academic achievement, no significant differences were found among CWA who were provided with SPED tutorials—alone or in combination—with

behavior coaching, and OT, ABA or their combination (tested separately in this study). School placement (i.e., big school, small school or small to big school shift) did not also influence academic achievement. This is in direct contrast to the findings of Kurth and Mastergeorge (2010) where they found school placement as significantly associated to CWA's academic achievement. Upon closer look on their methodology, however, it was observed that they only gathered data once, unlike in this research where data were gathered for five years.

As far as interventions (i.e., OT and ABA) are concerned, Burchinal and others (2006) also observed that the relationship between the interventions may either be strengthened or weakened or relatively the same across a certain period of time. It could be that strong relationships existed between the interventions during the first year up to the second year as commonly observed among early intervention programs (Arick, et al. 2003; Reed, et al. 2007). As a practice, this is usually so as CWA are thought to be at the peak of their atypical behaviors and delays. This, perhaps, might be similar to the case explained by Altieri and von Kluge (2009) wherein the relationship between the variables began to weaken when CWA started learning the basics and doing things on their own lessening the role of the intervention providers.

Lessons for children with special needs—including children with autism—are usually modified using special/

Table 3. Repeated Measures Analysis of Variance for Academic Achievement

EFFECT	<i>MS</i>	<i>Df</i>	<i>F</i>	<i>P</i>	Green-house	Huynh-Feldt
Time x SPED tutorials	.38	2.0	.99	.82	.50	.59
Time x School placement	2.22	3.9	1.18	.33	.48	.59
Time x Behavioral intervention	1.14	4.0	.69	.60	.50	.250

individualized methods and materials to address their needs (Dizon, et al. 2011). One reason why the presence of behavior coaching in SPED tutorials was not a significant factor that influenced academic achievement in this group might be that such intervention focused too much on behavior management for CWA (Dizon, et al. 2009). In such case when non-positive or atypical behaviors impeded learning, the tutor might have had no choice but to prioritize addressing the behaviors, rendering little or no time at all for improving academic achievement.

Managing behaviors that hinder effective learning is the same reason why parents send their children to OT, ABA and other behavioral intervention sessions. Similarly, focusing too much on behavior management (Rodgers, et al. 2010; Steege, et al. 2007) might have also been a possible reason why even with these behavioral interventions, there were no significant differences in academic achievement.

Occupational therapy and ABA are usually given in a center and at home, and as such, might not have had direct effects on CWA whose behaviors manifested in school especially as CWA have difficulty generalizing learned behaviors (Hume, et al. 2009). Unaddressed non-positive behaviors consequently, might have hampered academic achievement.

Subjects in this research were placed in general education/non-SPED schools, some in mainstreamed, some in inclusion

and others in integration classes regardless of their academic functioning levels. In the Philippines, general education schools follow the curricula required by the Department of Education (DepEd). Children with autism placed in these classes, therefore, are given the same lessons as their general education classmates as in inclusion classes, and the same lessons with slight to moderate modifications as in mainstreamed and integration classes (Dizon, et al. 2011). However, as most CWA in this study have academic delays as well, they might not have been able to cope with such lessons regardless of SPED supports. This might be the reason why placing CWA in general education classes regardless of class size (i.e., big or small school) was not a significant factor that affected academic achievement.

Psychosocial-Self-Care Achievement and Selected Factors

Repeated measures of Analysis of Variance showed that none of the given three factors has had a significant effect on psychosocial self-care achievement. Table 4 displays the *F*-ratio and *p*-values of each factor.

A goal for placing CWA in general education schools and/or providing them with SPED tutorials is for them to improve academically. If all efforts lead towards this goal, there is, therefore, a possibility that non-academics like psychosocial area, independence training and functional day-to-day communication

Table 4. Repeated Measures Analysis of Variance for Psychosocial Self-Care Achievement

EFFECT	<i>MS</i>	<i>Df</i>	<i>F</i>	<i>P</i>	Green-house	Huynh-Feldt
Time x SPED tutorials	.079	1.83	.15	.841	.460	.53
Time x School placement	.70	3.6	1.46	.238	.453	.56
Time x Behavioral intervention	.114	3.67	.19	.93	.459	.581

may not improve as much. The involvement of intervention-givers might decrease also through time as children improve (Hume, et al. 2009). This is another reason why other areas might not be given sufficient attention.

For children to improve in maturation including psychosocial, self-care and independence training, behavioral interventions such as OT, ABA and behavior coaching are usually provided (Altiere & von Kluge, 2009; Grindle, et al. 2009). Aside from a plan or program specifying intervention goals, strategies, materials/tools and activities, there must be an adequate number of hours per session within a given period. When there are combinations of these behavior interventions or when they are given alongside other non-behavioral interventions such as SPED tutorials, coordination is also needed; otherwise, gains may not be substantially felt (Carandang, 2009).

This study also did follow-up informal interviews with parents of the CWA. According to them, school placement, behavior interventions and other combinations of intervention like behavior coaching with SPED tutorials have helped their children cognitively, academically and psychosocially. These effects might have been felt and experienced individually by the parents. As a group, however, results for this part of the study showed no significant differences in terms of psychosocial-self-care achievement.

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

The results of this study showed that intellectual, academic and psychosocial-self-care achievements among children with autism significantly increased in a five-year span. Such, however, can be attributed only to school placement.

Specifically, differences were found in intellectual achievement in the group of CWA whose placement was shifted from small to big school. Such may be attributed to intellectual stimulation that CWA experienced in the big schools. Those who were placed in big schools without movement to small schools and vice-versa, however, did not register any differences.

No significant differences were also found across all other variables (i.e., academic and psychosocial-self-care achievements) despite the selected interventions (i.e., OT, ABA and behavior coaching). Unmodified or non-existence of lessons/curricula and facilities and materials individually designed for the CWA as well

In perspective, this study measured the dependent variables (intellectual achievement, academic achievement and psychosocial achievement) within five years (i.e., Time 1 to Time 5). This is in contrast to previous studies that measured dependent variables only once. The goal of this study was to see if impacts of the selected interventions were stable and consistent for five years. As mentioned in the discussion of findings in this study, it is possible that effects of intervention on certain variables may have changed over the years. These may be attributed to the trend that as CWA improve in the different key areas, the involvement of intervention and support-service givers are minimized (Hume, et al. 2009). Consequently, in this case, as the role of the intervention providers might have lessened, parents might have strengthened their involvement in their CWA's education and training, contributing to their children's overall improvement and achievements. With the knowledge that behaviors and delays among CWA's could persist throughout their lifetime, parents might have felt the

need to actually take it upon themselves to address such concerns.

Improvements, then, may not be solely attributed to organized, systematic and professionally-given intervention services and programs. The efforts and individual acts of concern from parents and other individuals like teachers, school staff, classmates, family members and relatives should not be discounted as they may be sources of important gains even in non-academic areas. Though the school may not have directly addressed the CWA's behaviors as specialized/therapy centers have, it could be a rich source of support for the CWA especially in terms of achieving educational and psychosocial priorities for the CWA. Thus, teachers, classmates and other school staff should be educated and trained properly and adequately in order that such priorities are effectively met.

The intervention programs and services selected in this study (i.e., OT, ABA and behavior coaching) were provided to the CWA in combination with other educational interventions (i.e., general education placement and SPED tutorials). These are, however, but a few of the interventions and programs available for CWA. Non-significant results in this study imply that achievements of CWA are highly reliant on the appropriateness of the combinations of interventions and programs, the effectiveness of plans and the accuracy of implementation including number of hours allotted for such. It would be beneficial to parents and other stakeholders, therefore, to study them in relation to how well children progress in intellectual abilities, academics and maturation across periods of time.

Overall results of the study further imply that the parent-respondents are very much concerned about their CWA's development in various areas (e.g.,

behavioral, socialization, independence, language-communication) now and in the future. This is the main reason why they have been actively involved with planning and implementing interventions for their children. Most of them face financial considerations courageously for as long as they know that they are doing and giving what is best for their children. Parents, tasked to make crucial decisions, openly consult with experts/specialists, intervention-givers and practitioners, family members, other parents and even printed and online resources for options they have to choose. Aside from training and education, parents (and family members) would benefit from professional help in planning intervention programs for their CWA. Specifically, appropriate and periodic psycho-educational assessment would be helpful in determining the types of interventions and school placement (or their combinations) as well as the amount of time that should be allotted for each. A psycho-educational assessment usually comes along with a program of educational priorities for the CWA and as such, intervention efforts become more specified and individualized.

Most of the time, more than one stakeholder is involved in each CWA's intervention. Thus, efforts among these stakeholders: parents, SPED and general education teachers, therapists, tutors and specialists should be synchronized. There should be collaboration and cooperation in planning till evaluation if gains are to be expected.

Succeeding studies would be beneficial for parents to be able to determine answers to more questions pertaining to their CWA's interventions and school placement. Considering findings of this study, future studies could specifically look into: the appropriate combination and balance

between educational placement and behavioral interventions; the contextualization of interventions; parents as intervention-providers; and, teachers as intervention-providers in the classroom and other factors that contribute to achievements of CWA in the different developmental areas. Longitudinal studies such as this one are helpful in giving stakeholders an idea as to the quality and effectiveness of their programs, services and support through the years.

In exploring further factors that may contribute to increases in intellectual, academic and psychosocial self-care achievements, more variables in the

context of motivational and support systems as empirically-tested among children with special needs are recommended. Along with this, it would be helpful if sample size is likewise increased. Single interventional and theory-driven studies may also be beneficial as long as they are grounded on empirical and theoretical frameworks.

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