IMAGINE - The First Six Months

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The Australian Optimal Learning Centre Pty Ltd (TAOLC), is a private company which was established on the 2nd February, 1998, in Perth, Western Australia, by Giordana Malabello. TAOLC (pronounced "TALK") was founded on the belief that all children have a right to effective education. To be effective, any educational program must be accountable in terms of its learning outcomes, and open to public scrutiny. It is the mission of TAOLC to provide effective instructional programs and individualised treatment, with care and respect, for children with autism, which allows them to reach their normative potential. Through carefully designed systematic behavioural instruction, TAOLC minimises dependence, maximises independence, increases social, communicative, academic and self help skills in children with autism, thus allowing them to integrate into all aspects of valued community life.

TAOLC was established specifically so that children with autism may enter mainstream education with appropriate skills and behaviours and sufficient independence to allow successful inclusion with minimum support, as a result of attending the program.

The instructional methodology used by TAOLC known as Fluency Building™ (Binder, 1988) is unique to TAOLC's instructional program for children with autism (in comparison to other instructional programs for autism) in Australia, and, as far as we know, world wide. The TAOLC model is based on the Morningside Model of Generative Instruction developed by Johnson & Layng (1992) in Seattle, USA. We refer to our model as I.M.A.G.I.N.E - the Intensive Model (Autism) of Generative Instruction Excellence. I.M.A.G.IN.E maximises generalisation of skills through "adductions" of performance (where skills are generated without direct teaching as a result of fluency in component skills), as it focuses on the rate and endurance of learning, rather than on one specific or accurate performance (for example, a discrete trial). Over a 17 year period, Morningside has consistently accelerated children's learning by an average of two and a half full grades in one academic year (Morningside Executive Summary, Winter 1998). However, Morningside does not have children with autism within their program.

Autism is "the ultimate learning disorder". Autism is defined by a set of observable behaviours - all of which prevent children with autism from learning through their natural environment. Children with autism are unlike other developmentally disabled, or learning disabled children in that they initially lack the skills, such as imitation, which they require to begin learning. In their natural state - that being the state of autism - and in their natural home and environmental settings, children with autism do not learn. The concept of learning as a natural phenomenon is not only challenged, it is completely defied, by autism. Thus, known and accepted natural

methods of teaching and instruction which are applied to the "normal" child, fail dismally when applied to children with autism. Children with autism will only learn when their environment is systematically and precisely structured for them in such a way that what is unnatural to them - learning - becomes possible. Through TAOLC's method of instruction, learning is not only fostered in children with autism, it is ***accelerated*** so that they may have the opportunity to "catch up" to their non-autistic peers.

METHOD OF TEACHING

The teaching methodology of TAOLC is based on the principles of the science of Applied Behaviour Analysis (ABA) and specifically, Precision Teaching with Fluency Building™ (Binder, 1988). TAOLC's instructional model is one of "generative instruction" (Johnson & Layng,

1992). Precision Teaching is a technological method of teaching which allows optimal instruction for each learner through precise performance measurement and analysis. The catch cry of Precision Teaching is, "the learner knows best" (Lindsley, 1996). If an instructional task does not work, it is seen as a fault of the task, and how it has been presented. It is not the "fault" of the learner. Therefore, the responsibility for learning outcomes is squarely on the teacher. It is the teacher's job to seek constructive solutions to the learning challenges the learner presents.

Methods used are based on empirical (data based) research and TAOLC will incorporate new instructional technology as developed, trialed and tested. This is the nature of inductive science - it builds a body of knowledge according to "what works". It selects "what works" by the data collected. TAOLC's model of generative instruction systematically employs the specific - measurably superior - sequential behavioural techniques as follows:

- target behaviours (those which are relevant, important and useful) are chosen and clearly defined in all areas of the learner's learning
- the learner's baseline (behaviours already learned) is clearly established in relation to those target behaviours in order to form a solid foundation for learning
- an individual education program (IEP) is drawn up which includes behavioural statements of a logical and functional sequence of small steps for all target areas of instruction together with a precise description of methods of instruction
- behaviours are taught that replace dysfunctional behaviours when these behaviours demonstrably interfere with learning and development
- instruction in new behaviours is delivered through: fast paced individual discrete trials including direct concrete instructions, prompts when necessary, post response positive consequences, until accuracy of performance is established
- accurate performance is then shaped through free operant Fluency Building™ (Binder, 1988) which eliminates Fluency Blockers™ (Binder, 1988) in order to accelerate optimal learning
- new behaviours are taught to levels of fluency that generalise and maintain in the learner's natural home, school, work and community environments
- precise regular measurements of the learner's behaviours are carried out to provide continuous feedback about the effects of the teaching program on the learner's immediate learning rates and longer term outcomes
- mastery of learning is defined by retention, endurance, stability, application, and adductions of performance (RESAA) as confirmed by the learner's performance data entered on Standard Celeration Charts (Lindsley, 1996)
- corrective changes are made on a day-to-day, and often on a minute-by-minute, basis to the details of the program if a learner's rate of progress is shown to slow down to unacceptable rates of learning as shown on the S.C. Charts.

The power of this instructional methodology lies firstly in its continuous data collation, as corrective changes can be made on a minute by minute basis. In this manner, there is no time wasted on instructional tasks which are not producing the desired learning outcome. Secondly, the generative nature of the instruction - where adductions of learning performance occur - a large portion (Morningside suggests up to one third) of direct teaching is eliminated. Where a

learning component of a particular "response class" is learned to high levels of fluency (or "automaticity"), it generalises across that entire response class with minimal, if any, further instruction. This is what is meant by an "adduction" of performance. For example, where the numbers 0 to 15 have been taught to fluency, the child may, upon first presentation of the following numbers, state those numbers accurately with *no* instruction e.g. "16", "17", "18", "19".

PROGRAM STRUCTURE

All the children within the program have been diagnosed with autism, or autism spectrum disorders. Some have other additional physiological and/or neurobiological factors. The program began with six children, and now caters for 12 children. The maximum intake, at full capacity, will be 24 children. The ages of the children range from three years and ten months (upon entry), to ten years and six months.

The program itself is organised into a 40 week academic year, with four terms, and each term containing two five week blocks. The program runs five weeks on, and one week off, consecutively for the 40 weeks. This allows a built-in non-intervention, or non-teaching, period of one week, following each five week block of instruction. In this manner, the children can be tested for maintenance and generalisation of learned skills immediately following the non-intervention period. To date, TAOLC has run for 20 weeks, or two terms.

The curriculum is designed around five stations: Imitation, "Big 6" (as developed by Ann Desjardin et al), Communication, Pre-academics, and Play. Children move from station to station, and are instructed on a one-to-one basis. The stations run for 30 minutes each. The instructional session lasts for three hours. Children attend for a maximum of 15 hours per week, and a minimum of three hours per week. When appropriate, peer tutoring is implemented. Due to the age and skill level of the children, none of the children are "self-charting". However, all children self-present learning tasks as soon as accuracy is attained, and most of them set the timers for fluency drills.

Following attained accuracy of any given skill, a one minute timing is taken of that skill as a baseline measure. Virtually all the children require "sprints" (timings of ten, fifteen, or twenty seconds) in order to build their fluency rates and develop endurance. It is rare for any of our children to be able to build performance rates beginning with, and maintaining, one minute timings. A sample summary of fluency data follows.

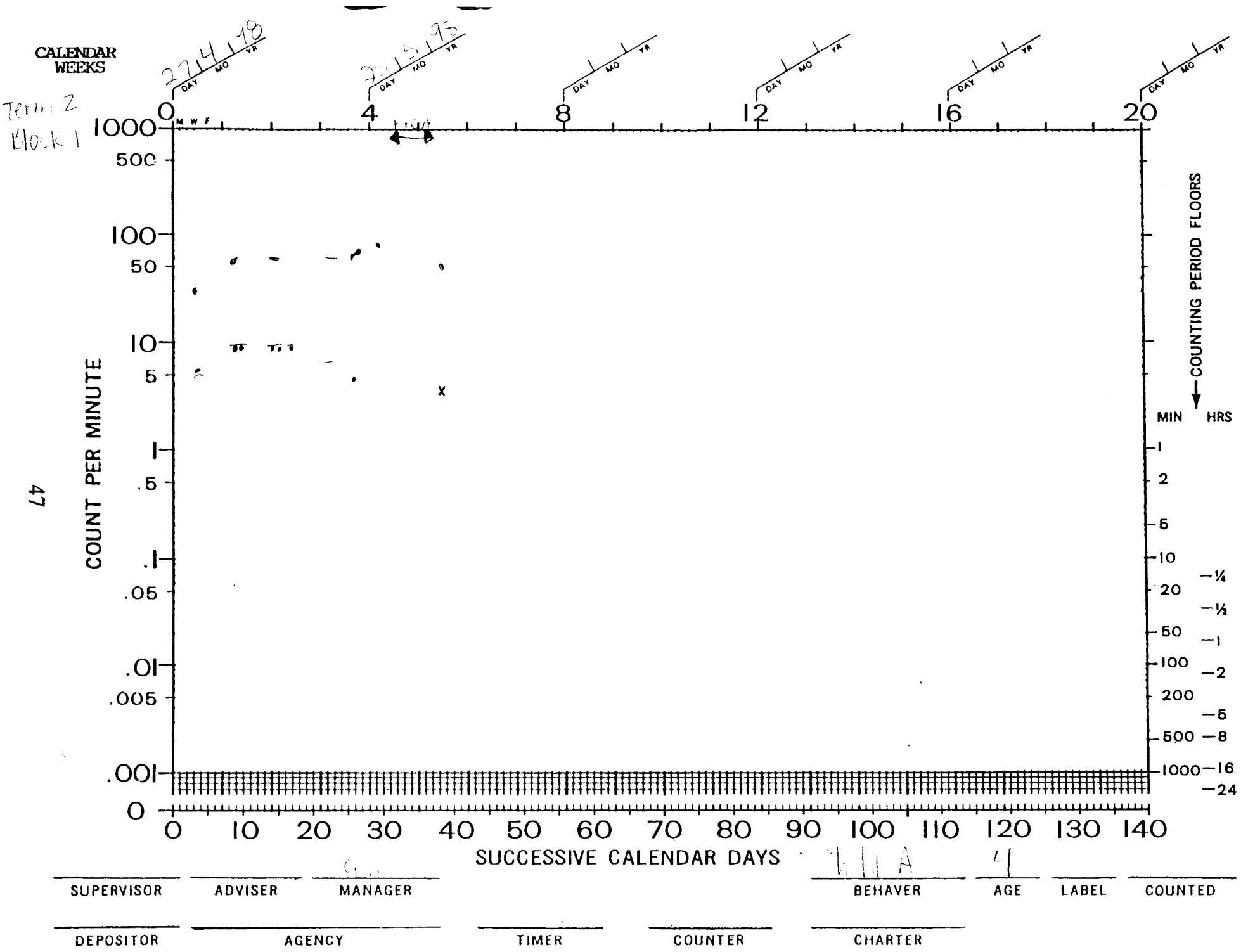
DATA

There are several hundred celeration charts either completed, or in use, at TAOLC. Sessional charts show trial-by-trial scores ("trial" refers to the timing, so that a trial can be anything from 10 seconds to one minute in length). Daily Charts show a "best score, least error" measure for the day only. Each skill for each child has two sets of charts: the trial charts, and the daily chart. Any one skill can have from 5 to 20 trials recorded in each session. Children can be working on anything up to 50 skills in any teaching block. A sample of three children's data in the form of a summarised matrix is offered. Child A, with a diagnosis of autism, attends for six hours per week. Child B, with a diagnosis of autism, attends for 15 hours per week. Child C, with a diagnosis of autism, attends for 15 hours per week. Only one of the three children has attended for twenty weeks. For reasons of confidentiality, no other specific information can be given about the children.

Figures 1 – 3 show scores as a rate of performance per minute with corrects over errors (e.g 20/1 = 20 correct, one error). Where sprints are used, timing is shown in seconds. One minute timings are used as a baseline entry measure. Fluency building usually commences with a shorter timing, as indicated. "Mastery" can be either the "mastered" score, or simply the last measure taken, that is the "end" score, for the particular teaching block. All the Fluency Checks refer to the one minute follow-up measures immediately after the one week non-intervention period. Where the Fluency Check is not considered a sufficient score, it acts as the baseline measure, or entry score, for the following five week intervention period. Where the skill is considered sufficient, as it has retained and shown endurance, the skill is checked for stability (we distract the children during baseline testing), application (we change the presentation or format of the skill) and adductions (we probe ahead for generalisations, and/or more complex performances requiring that component skill). Thus, we do a test of "RESAA" for skills which the data indicate as fluent.

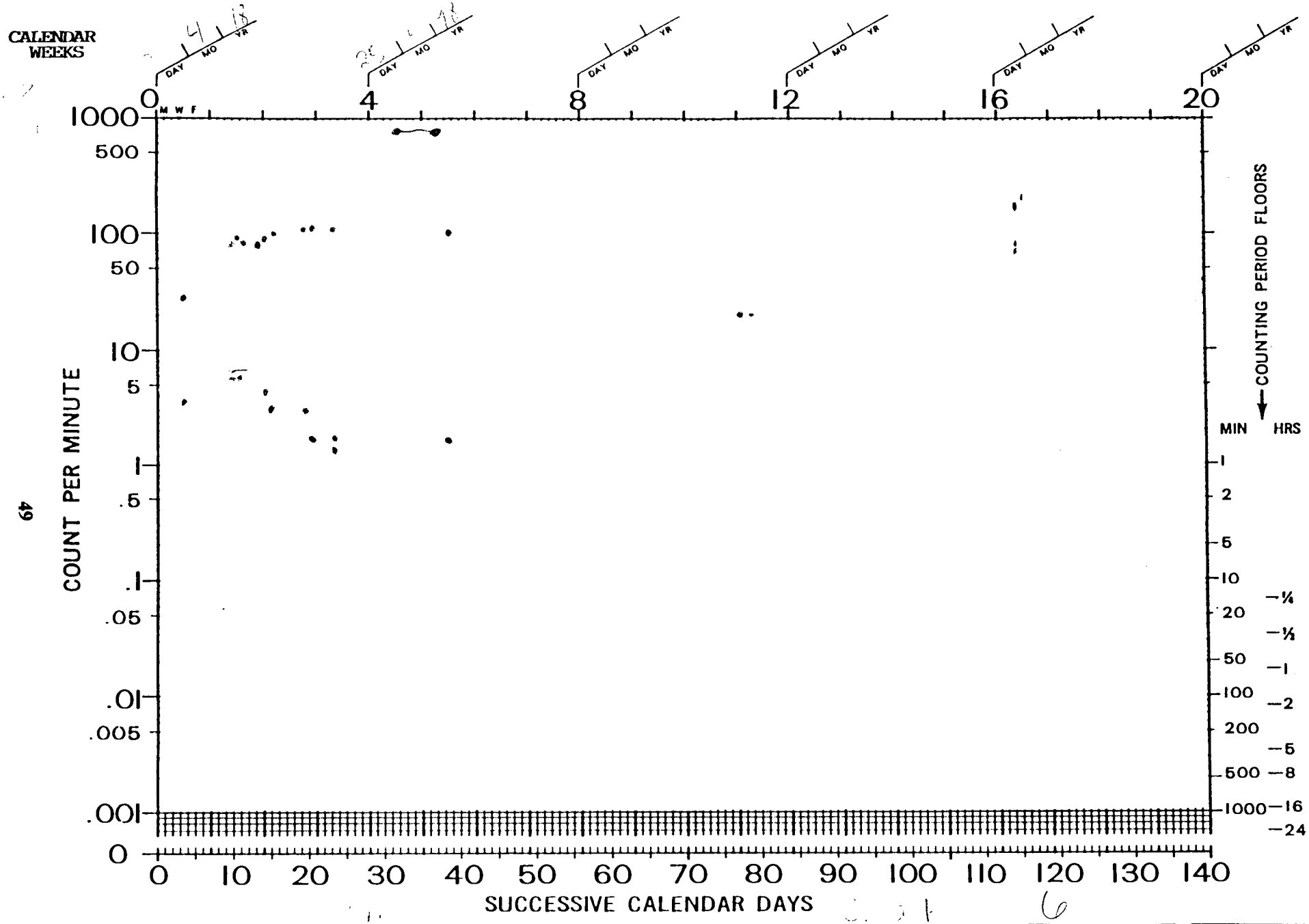
NAME: Child A **Figure 1**

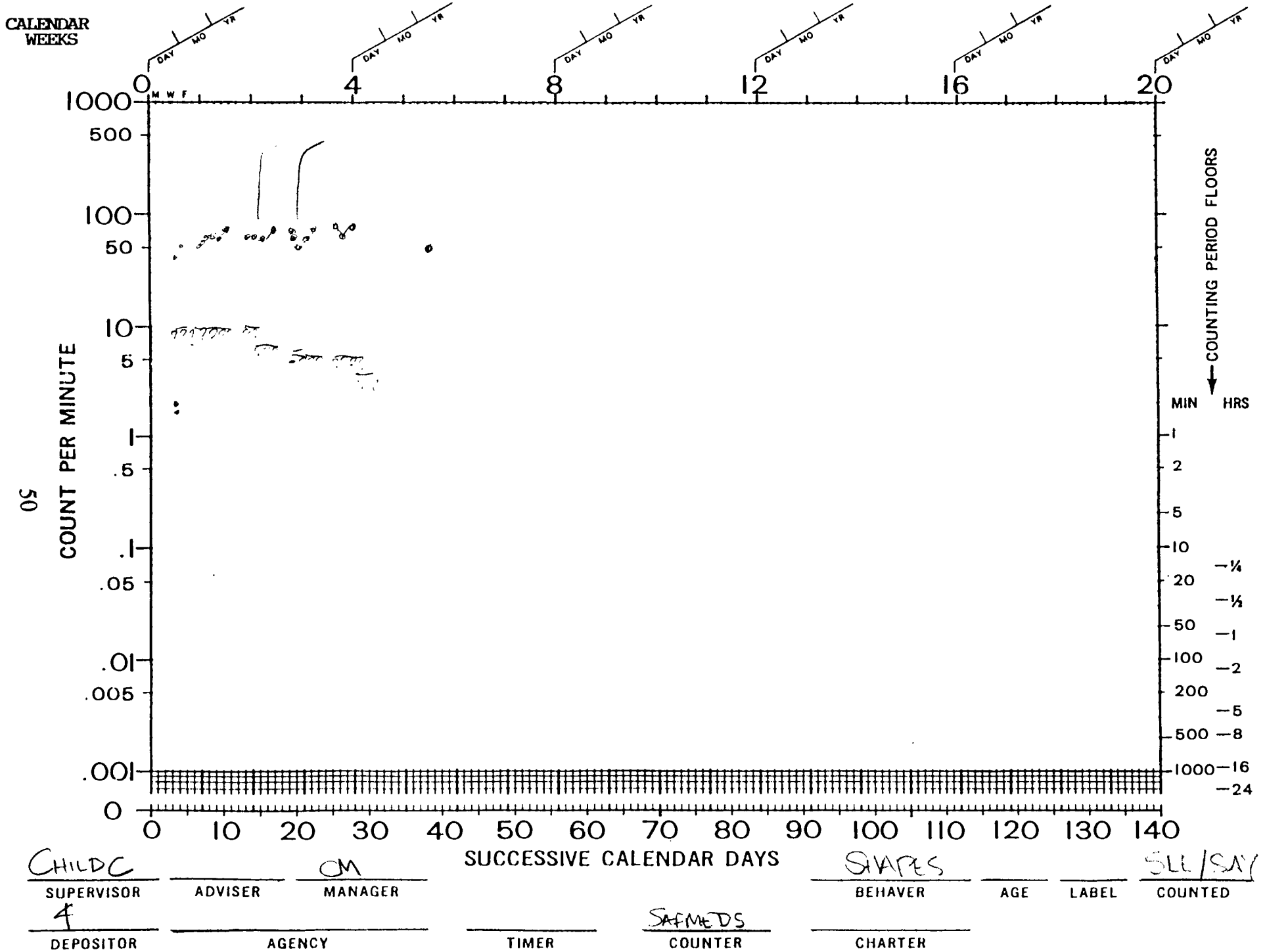
SKILL	**ACCURACY PHASE**		**FLUENCY BASELINE**		**FLUENCY BUILDING**		**FLUENCY MASTERY**		**FLUENCY CHECK**	
(STATION) **Big 6 (Fine Motor)**	DATES @ 100%		BASELINE (1 minute) Date	Score	BEGIN (seconds) Date	Score	END (seconds) Date	Score	BASELINE (1 minute) Date	Score
1. Thumbs up/down	28.4		28.4	24/3	1.5	15" 35/0	29.5	60" 105/0	9.6	110/0
2. Pincer (RH)	28.4		28.4	45/6	1.5	15" 150/0	29.5	60" 120/0	9.6	150/0
3. Pincer/Wrist	28.4		28.4	110/0	1.5	10" 180/0	29.5	60" 180/0	9.6	150/0
4. SAFMEDS (Blank)	28.4		28.4	24/0	30.4	10" 28/0	29.5	30" 48/0	9.6	46/0
5. Squeeze	28.4		28.4	80/0	7.5	10" 110/0	29.5	20" 120/0	12.6	80/0
6. **Communication** Hear/say "m,s,a"	28.4		1.5	22/3	7.5	10" 42/0	29.5	20" 62/0	9.6	38/2
7. Nouns: apple ball,car,dog,duck	1.5		5.5	20/3	7.5	10" 30/0	29.5	60" 40/0	9.6	25/2
8. **Imitation**: Gross motor	28.4		28.4	38/2	30.4	20" 60/0	27.5	20" 120/0	9.6	78/1
9. Oral motor	28.4		28.4	23/2	30.4	10" 66/0	27.5	20" 105/0	9.6	46/1


CALENDAR WEEKS
Term 2
Block 1
DAY MO YR
0 4 8 12 16 20
M W F
1000
500
100
50
10
5
1
.5
.1
.05
.01
.005
.001
0
COUNT PER MINUTE
COUNTING PERIOD FLOORS
MIN HRS
1
2
5
10
20
50
100
200
500
1000
¼
½
1
2
5
8
16
24
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
SUCCESSIVE CALENDAR DAYS
SUPERVISOR
ADVISER
MANAGER
BEHAVER
AGE
LABEL
COUNTED
DEPOSITOR
AGENCY
TIMER
COUNTER
CHARTER

NAME:Child B **Figure 2**

SKILL	**ACCURACY PHASE**		**FLUENCY BASELINE**		**FLUENCY BUILDING**		**FLUENCY MASTERY**		**FLUENCY CHECK**	
(STATION)	DATES @ 100%		BASELINE (1 minute)		BEGIN (seconds)		END (seconds)		BASELINE (1 minute)	
Pre Academics:	Accuracy		Date	Score	Date	Score	Date	Score	Date	Score
1. See/say all Colours (SAFMEDS)	29.4		29.4	16/3	1.5	10" 52/0	27.5	60" 60/0	8.6	52/0
2. See/say all Shapes (SAFMEDS)	29.4		29.4	15/3	1.5	10" 30/0	29.5	30" 54/0	8.6	32/0
3. See/say numbers # 0-9	4.5		4.5	42/1	4.5	10" 66/0	28.5	20" 78/0	8.6	57/0
4. See/say numbers # 10 - 19	4.5		4.5	27/0	4.5	10" 30/6	25.5	15" 136/0	8.6	76/4
5.**Communication:** long/short	20.5		22.5	60/2	26.5	20" 105/0	28.5	30" 98/0	8.6	81/0
6.Prepositions in/on/under	29.4		1.5	20/2	7.5	15" 62/0	28.5	60" 86/0	8.6	90/0
7. Big/little	11.5		13.5	60/0	13.5	10" 120/0	20.5	60" 110/0	8.6	90/0
8.Phonemes: m,s,a,e,t (linear)	29.4		11.5	80/0	14.5	10" 90/0	30.5	60" 110/0	8.6	95/0
9. Pronouns he/she	1.5		6.5	52/2	6.5	15" 76/0	23.5	60" 78/0	8.6	60/0
10. Verbs "ing" actions	6.5		11.5	31/0	15.5	15" 92/0	30.5	60" 100/0	9.6	72/0


CALENDAR WEEKS
DAY MO YR
0 4 8 12 16 20
M W F
1000
500
100
50
10
5
1
.5
.1
.05
.01
.005
.001
0
COUNT PER MINUTE
COUNTING PERIOD FLOORS
MIN HRS
1
2
5
10
20
50
100
200
500
1000
¼
½
1
2
5
8
16
24
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
SUCCESSIVE CALENDAR DAYS
SUPERVISOR
ADVISER
MANAGER
BEHAVER
AGE
LABEL
COUNTED
DEPOSITOR
AGENCY
TIMER
COUNTER
CHARTER


CALENDAR WEEKS
DAY MO YR
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COUNT PER MINUTE
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COUNTING PERIOD FLOORS
MIN HRS
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8
16
24
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
SUCCESSIVE CALENDAR DAYS
CHILDC
SUPERVISOR
ADVISER
CM
MANAGER
SHAPES
BEHAVER
AGE
LABEL
SLL/SAY
COUNTED
4
DEPOSITOR
AGENCY
TIMER
SAFMEDS
COUNTER
CHARTER

NAME Child C **Figure 3**

SKILL	ACCURACY PHASE		FLUENCY		FLUENCY BUILDING		FLUENCY MASTERY		FLUENCY CHECK	
(STATION) IMITATION:	DATES @ 100%		BASELINE (1 minute) Date	Score	BEGIN (seconds) Date	Score	END (seconds) Date	Score	BASELINE (1 minute) Date	Score
1. Oral Motor (5 skills)	28.4		29.4	27/0	30.4	10" 90/0	30.5	20" 120/0	8.6	82/4
2. Gross motor (14 skill)	28.4		29.4	41/0	30.4	10" 90/0	30.5	30" 105/0	8.6	89/5
3. **"Big 6":** Pincer	16.5		16.5	50/6	19.5	20" 85/0	30.5	60" 120/0	8.6	122/0
4. Thumbs up/down	29.4		30.4	94/0	7.5	20" 110/9	30.5	60" 110/0	8.6	80/0
5. SAFMEDS (blank)	15.5		18.5	35/0	18.5	10" 54/0	30.5	30" 48/0	8.6	45/0
6. **Communication**: in/on/under	1.5		1.5	20/3	5.5	10" 38/0	30.5	60" 72/0	8.6	90/1
7. big/small	1.5		4.5	42/1	14.5	60" 50/3	26.5	60" 88/0	8.6	82/0
8. action "ing" verbs	15.5		15.5	32/1	19.5	15" 48/4	28/5	20" 38/0	9.6	33/1
9. **Pre Academics:** Phonemes: m/s/a	8.5		8.5	32/3	9.5	10" 60/0	30.5	60" 100/0	8.6	80/1
10. See/say Shapes (5)	(5) 28.4	(all) 18.5	(5) 30.4	27/0	(All) 18.5	10" 38/0	29.5	30" 52/0	8.6	37/2
11. # 0-9 (see/say) Number Recognition	30.4		30.4	38/3	4.5	10" 42/0	29.5	30" 52/0	8.6	53/0
12. See/say Colours (all)	30.4		30.4	22/0	1.5	10" 42/0	29.5	30" 42/2	8.6	47/0

The above data indicates clearly that it is appropriate to apply the teaching technologies suggested by Morningside to children with autism, and that the same gains can be expected of them as can be expected of their non autistic peers.

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