

# Using cumulative graphs to guide goal objectives in the ESDM



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## Introduction

- The ESDM is a comprehensive, play-based behavioural intervention designed for young children between 12 to 48 months with ASD
- Skill items in each domain are assessed using three scoring conventions: “+” (mastery, consistently performed), “+/-” (emerging, inconsistently performed), and “-” (no examples observed, difficult to elicit)
- Information from the ESDM Curriculum Checklist is used to identify skill items from each domain as well as the client’s learning rate is considered to develop goal objectives that are achievable in the next 3 months
- Data can be displayed using numerical values or through visual representation, such as bar graphs or lines graphs
- Graphs are fundamental tools in behaviour analysis as it allows clinicians to visually assess and make data-driven decisions on target goal objectives to improve client progress

## Purpose

The purpose of this poster presentation is to summarize how the results from the ESDM Curriculum Checklists can be displayed on cumulative graphs to guide goal objectives for development of client individualized programs. In addition, the utility of using cumulative graphs in comparison to numerical values for guiding goal objectives and understanding client skill acquisition across domains is illustrated.

## Methods

### Participant and Settings

- Four year old boy with Autism
- ESDM curriculum assessments were conducted at the participant’s daycare with a variety of toys, crafts, and other appropriate materials and in the outside play area with his peers

### Materials

- ESDM Curriculum Checklist and ESDM Handbook
- Numbers on Apple MacBook

### Independent Variable

- ESDM Curriculum, 8 hours/week, one-on-one intervention

### Dependent Variables

- Scored curriculum assessments across different periods of time and client skill acquisition across domains

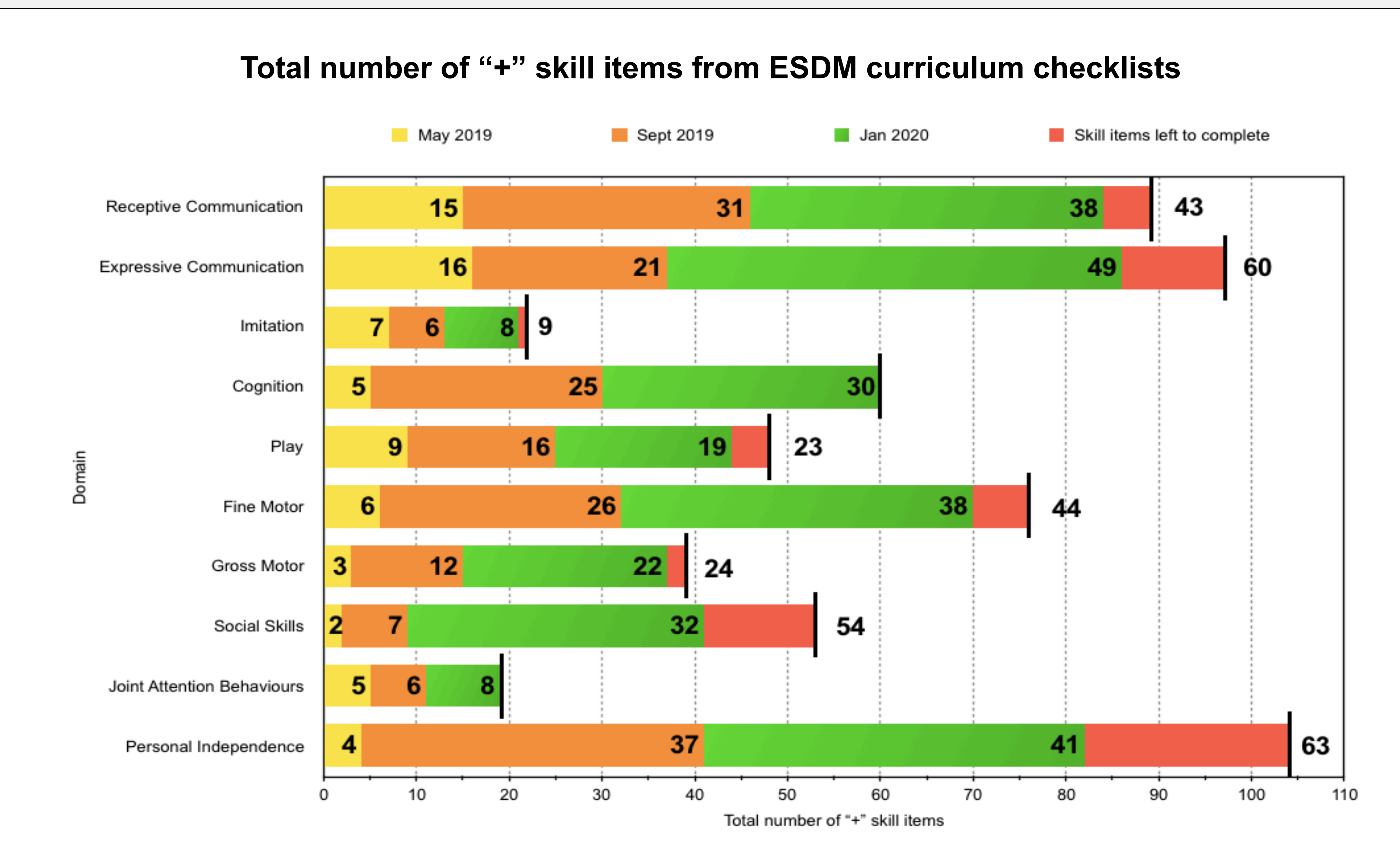
### Procedure

- Total number of “+” skill items from ESDM curriculum checklists were calculated for each domain and plotted onto a numerical table
- Total number of domain items targeted for ESDM curriculum were calculated for each domain and plotted onto a numerical table
- Total number of “+” skill items from ESDM curriculum checklists were plotted onto the stacked bar graph for each domain
- Total number of skill items in ESDM curriculum checklists for each domain from level 2 and onwards were calculated and plotted onto the stacked bar graph with a solid line and the corresponding numerical value

Figure 1: Numerical Values for May 2019, Sept 2019, and Jan 2020 ESDM Curriculum Checklist

Total number of “+” skill items from ESDM curriculum checklists				Total number of domain items targeted for ESDM Curriculum			
Domain	May 2019	Sept 2019	Jan 2020	Domain	May 2019	Sept 2019	Jan 2020
Receptive Communication	15	31	38	Receptive Communication	6	3	2
Expressive Communication	16	21	49	Expressive Communication	9	8	2
Imitation	7	6	8	Imitation	3	2	0
Cognition	5	25	30	Cognition	0	0	0
Play	9	16	19	Play	4	0	4
Fine Motor	6	26	38	Fine Motor	4	2	2
Gross Motor	3	12	22	Gross Motor	1	0	0
Social Skills	2	7	32	Social Skills	4	11	6
Joint Attention Behaviours	5	6	8	Joint Attention Behaviours	1	0	0
Personal Independence	4	37	41	Personal Independence	0	0	1

Figure 2: Cumulative Graph for May, Sept 2019 and Jan 2020 ESDM Curriculum Checklist



## Discussion

- Cumulative graphs allowed clinicians to visually see the cumulative total of “+” skill items for each domain across multiple ESDM Curriculum Checklists
- The total number of domain items targeted for ESDM curriculum were used to analyze the utility of cumulative graphs for guiding goal objectives and understanding client skill acquisition across domains
- For May 2019 ESDM curriculum, the cumulative graph allowed clinicians to visually see the “+” skills that incidentally emerged across domain items such as, cognition, personal independence, receptive communication, play, fine motor, and social skills that were not targeted for intervention
- For September 2019 ESDM curriculum, the cumulative graph allowed clinicians to visually see a significant growth in expressive communication and social skills domains, which guided clinicians to target domain items focusing on expressive communication and social skills within the context of group intervention instead of one-on-one intervention as a result of learning the client was capable of acquiring skill items in the ESDM with his peers
- For January 2020 ESDM curriculum, the cumulative graph was used to visually analyze client acquisition of skill items across domains with the total number of skill items in the ESDM left to complete and guided clinicians to target domain items to acquire mastery of the ESDM as well as skills essential for Kindergarten

## Implications for Practice

- Results from ESDM Curriculum Checklists can be displayed on cumulative graphs to guide goal objectives for development of client individualized programs
- Cumulative graphs allow clinicians to better understand client skill acquisition across domains over different periods of time and to visually assess areas of growth that may be significant to target or may have been difficult to identify with numerical values
- Moreover, cumulative graphs guide clinicians to write goal objectives that are appropriate and achievable for the client using the information presented through visual representation, such as a stacked bar graph
- Cumulative graphs are efficient tools for conveying behaviour-analytic information to parents and other professionals in user-friendly manner that is easy to understand and interpret

## References

- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2<sup>nd</sup> ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.
- Rogers, S. J. & Dawson, G. (2010). *Early Start Denver Model for young children with autism: Promoting language, learning, and engagement*. NY: Guilford Press.
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