

A Study to Assess the Impact of Cartoon on Developmental Domains of Communication in Children Aged 4 to 6 Years

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ABSTRACT

Aspects that inculcate children's way of thinking are found mostly in the environment where they grow up. These include everyday happenings, memorable experiences and their acquaintances. It is truly said that every child is like a piece of paper and anything written on it marks their personality and future behavior. Parents should be very keen on nurturing them at their very young age. It is proven that the first years of life are a period of incredible growth in all areas of a child's development. This critical period is the maturational stage in the lifespan of an individual during which the nervous system is sensitive to many environmental stimuli. Today's technology has developed too much which has both negative and positive impact on us. Infants and toddlers in today's society are living in environments that are saturated with television and electronic media. Whereas in the past children spent their time in outdoor activities, playing with their peers and enjoying different games. The present study highlights the impact of cartoons on young children and also indicates which variables of this media are affecting different domains of the child's development.

Keywords: cartoon, communication, developmental domain, content, duration, age

1. INTRODUCTION

“Catch them young” is no longer a mere phrase. It has been scientifically proven that the first eight years of life are a period of incredible growth in all areas of child's development. This critical period is the maturational stage in the lifespan of an organism during which the nervous system is sensitive to many environmental stimuli. Children go through specific physical, social/emotional and cognitive development during this period. The brain development is influenced by many factors like child's

relationship, experiences and environment. Infants and toddlers in today's society are living in environments that are saturated with television and electronic media. Whereas in the past children spent their time in outdoor activities playing with their peers and enjoying different games.

Spontaneous play is natural and healthy for children. Through play all areas of a child's development can be enhanced. Research shows that play positively supports children's social/emotional, physical, cognitive, language, and literacy

skills. It is essential to a child's overall healthy development. However, Infants and toddlers in today's society are living in environments that are filled with television and electronic media. Recently, there has been an explosion of television channels specifically marketed towards these very young children. Despite this increase, little research has been done on the impact television viewing has on this very young population.

The American Academy of Pediatrics (1999)¹ recommends that children two years and under not be exposed to television, and children older than two years be limited to one to two hours of educational television per day. Regardless of these recommendations, a national survey revealed that 43 percent of all children under the age of two watch television every day, averaging two hours and five minutes each day. In fact, watching TV in moderation can be a good thing. No doubt about it, television can be an excellent educator and entertainer. But despite its advantages, too much television can be detrimental.

A child's developmental level is a critical factor in determining whether the media will have positive or negative effects. A significant number of children begin watching television at an earlier age and in greater amounts than what experts recommend. Evidence suggests that television's influence on children and adolescents is related to how much time they spend watching television. As a result, with prolonged viewing, the world shown on television becomes the real world. The rapidly moving images on TV and video games may rewire the brains of very young children, making it difficult for them to focus on slower task that require more thought. Research shows that early exposure to television during critical periods of synaptic development would be associated with subsequent attention problems and it may be an important trigger for Autism, the incidence of which appears to be increasing.

Typically, children begin watching cartoons on television at an early age of six months, and by the age two or three it becomes their passion. Child's brain at early ages always seeks new experiences. Therefore, whatever delivered in cartoon gets toddlers glued into their chairs. A well written scenario, right audio & visual effects and a descent looking character, are all the main factors for the child to get stuck for the cartoon hero, and enough for his brain to begin automatically follow his path and trying to be a copycat even for the finest details, including way of speaking, thinking, body language and even the way of dressing up. The television can be compared to a knife, very useful and at the same time it can be a source of harm to the people. Therefore, it is necessary for the parents to understand how these programs influence their child's development.

1.1 Purpose the study

There is a paucity of research related to the impact of cartoon entertainment on the developmental domains of communication. Most of the existing studies investigated the impact of general TV watching on child development. Existing studies highlighted the psychological impact rather than cognitive communication. In India almost all the children are exposed to cartoons of different content, duration and language. Therefore, the intention of the present study is to comment on the influence of cartoons on communication development with reference to content, duration and age of exposure to cartoons.

1.2 Aim of the study:

The aim of the study was to understand the impact of content and duration of cartoon viewing on the developmental domains of communication in children aged 4to8years

1.3. Objectives:

- To investigate the impact of content and duration of cartoon viewing on speech and language development.

- To investigate the impact of content and duration of cartoon viewing on social aspects of communication development.
- To investigate the impact of content and duration of cartoon viewing on behavioral aspects of communication development.
- To investigate the impact of content and duration of cartoon viewing on cognitive aspects of communication development.

2. MATERIALS AND METHODS

The entire study was carried using the developmental checklist and standardized test materials which addressed four developmental domains of communication namely; speech and language, social, behavioral and cognitive domains. The study included 124 participants in the age range of 4 to 6 years.

On the basis of duration and content of watching cartoon, the subjects were divided into 4 groups- Group A1, A2, B1

and B2. Group A1 consisted of 30 children who were watching cartoons less than 2 hours per day and group A2 consisted of 34 children with greater than 2 hours of cartoon exposure per day. Group B1 consisted of 30 children who were exposed to non - aggressive type of cartoon and group B2 consisted of 30 children who were exposed to aggressive type of cartoon (Table 1).

Data were collected from 4 schools in the urban areas of Palakkad and Thrissur districts of Kerala, India. Children with cognitive deficits, sensory loss, motor deficits, maturation delays, speech-language delays/disorders, behavioral issues and also from exceptional circumstances such as orphanages, juvenile home, neglect, abuse etc. were not been considered for the study. Informed consent was obtained from the parents and significant others after a detailed explanation of their role and contribution in the research study.

Table 1. Subject selection based on duration and content of watching cartoon

Groups	Content		Duration	
	A1 (watching cartoon less than 2 hrs)	A2 (watching cartoon greater than 2 hrs)	B1 (watching non aggressive cartoon)	B2 (watching aggressive cartoon)
No: of children	30	34	30	30

Initially parent/ caregiver of the participants were interviewed and the checklist which was developed by Sudhakaran² was given to them. The participants were explained about the purpose and methods of the study and they were instructed about the checklist and procedure of rating. The developmental checklist consists of two parts, Part A and Part B. Part A included questions regarding the duration, frequency and types of cartoon exposure and part B questions addresses the four developmental domains of communication:- speech and language, social, behavioral and cognitive domain. Each domain consisted of 10 questions. The questions were made in the form of a five point rating scale. The developmental checklist was framed such that higher scores indicated poorer skills. The questions were

short, simple and clear. There were overall 40 questions in the questionnaire under the four domains Percentage scores and central tendency of the responses was calculated after the administration of checklist.

Then two standardized test materials were administered, which were Communication DEALL (developmental eclectic Approach to Language Learning) (Com DEALL) by Karanth³ for speech, language, Cognitive and Social domains and Attention-deficit/Hyperactivity Disorder Test (ADHD T) given by Gilliam⁴ for behavioral domain.

ComDEALL consists of 3 domains: Motor domain, Communication domain, higher mental function. These main three domains consist of 8 sub domains out of which mainly 4 domains (Receptive language, Expressive language, Cognitive

and Social domain) were selected for the study. Responses were scored as follows.

- 0- Not acquired
- 1- Acquired but lost
- 2- Acquired but inconsistently present /emerging
- 3- Acquired and consistently present but only in specific situation,
- 4- Acquired and consistently present across a situations.

Time taken for the test administration for each participant was 45 minutes.

ADHD T has three subtests: The Hyperactivity, the inattention and the impulsivity sub test and included a total of 36 items. It is a 3-point rating scale.

- 0- Not a problem
- 1- Mild problem
- 2- Severe problem

Scores were computed for each subtest. Low scores are indicative of person with little or no behavioral problems and high scores are more indicative of ADHD or behavior problems. Time taken for the test administration was 20 minutes. The score sheets and response sheets were collected for the purpose of documentation and further analysis.

The data collected were then subjected to statistical analysis using Statistical protocol for Social Sciences (SPSS) (20.0) version. Mean, and Standard deviation values have been derived for all the participants across all the domain in the checklists. Mann Whitney test was used for the comparison of groups according to the content and duration of cartoon viewing in children across the developmental domains of communication.

3. RESULT

The present comparative study analyzed the impact of duration and content of watching the cartoon on developmental domains of communication in children (n=124) aged 4 to 6 years. The

developmental checklist (Sudhakaran, 2017) and standardized test materials (Com DEALL & ADHD T) were administered and scores were recorded

Based on duration of watching cartoon the participants were divided into two groups; Group A1 (includes 30 children watching cartoon less than 2 hrs.) and Group A2 (includes 34 children watching cartoon more than 2 hrs.). Based on the content of watching cartoon participants were divided into two groups; Group B1 (includes 30 children of watching non-aggressive cartoon) and Group B2 (includes 30 children of watching aggressive cartoons).

Statistical analysis was done. Mean and the standard deviation of each domain were calculated for group A1 & A2 and group B1 & B2. Mann Whitney U test was used for the comparison between the groups.

As the scoring of the checklist is inversely proportional to performance, the high mean value indicates the poor performance. From the figure 1, it can be understood that Group A1 and B1 showed less mean values indicating better performance and group A2 and B2 showed higher mean values indicating poor performance on all four developmental domains of the checklist. As higher mean value indicates poor performance, in group A2 and B2 we can observe that behavioral domain is the most affected one followed by social, speech & language and cognitive domain. Compared to the A1 and B1 group, group A2 and B2 scored higher on the 5-point rating scale in all the four developmental domains.

Mann Whitney U test used for the comparison of group A1 & A2 and group B1 & B2. Results indicate that there is a statistically significant difference present between-group A1& A2 and B1&B2 in all the four domains (Table 2).

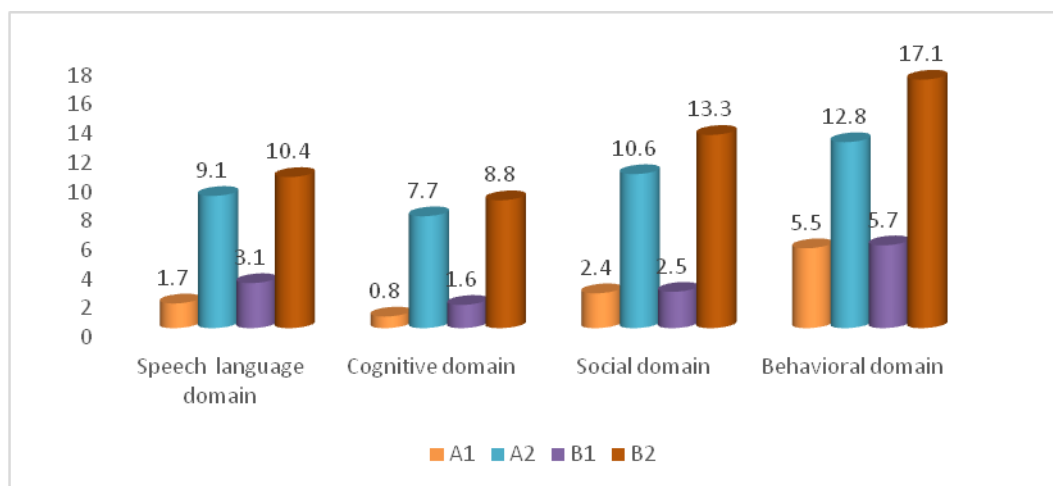


Figure1: Mean (M) scores of group A1& A2 and group B1&B2 across each domain of developmental checklist.

Table.2: The Mean (M), Standard deviation (SD) and Mann Whitney U test results of Developmental checklist, of group A1 (watching cartoon < 2 hours) & A2 (watching cartoon >2 hours) and group B1(watching non-aggressive cartoon) &B2 (watching aggressive cartoon).

	Group	N	Mean	SD	Mann Whitney U test		
					Z	P	
Speech and Language Domain	A1	30	1.7	2.56882	-6.501	.000000	HS
	A2	34	9.1	1.40916			
	B1	30	3.1	3.74243	-5.884	.000	
	B2	30	10.4	2.25501			
Cognitive domain	A1	30	.8000	1.27035	-5.841	.000000	HS
	A2	34	7.7	3.50808			
	B1	30	1.6	2.44221	-6.178	.000	
	B2	30	8.8	2.85371			
Social domain	A1	30	2.4	3.29768	-4.820	.000001	HS
	A2	34	10.6	6.02527			
	B1	30	2.5	4.08262	-5.791	.000	
	B2	30	13.3	4.77409			
Behavioral domain	A1	30	5.5	4.56171	-4.240	.000022	HS
	A2	34	12.8	6.29156			
	B1	30	5.7	5.1	-5.639	.000	
	B2	30	17.1	4.9			

Results indicated that there was a statistically significant difference between-group A1& A2 and B1&B2 in all the four domains.

Standardized tests (Communication DEALL checklist &and ADHD T) results were well correlated with the results obtained from the developmental checklist. The Mean and the standard deviation of speech and language domain, cognitive, and social domains of Communication DEALL checklist was calculated for both A1&A2 and B1 &B2 groups. Mann Whitney U test was used for the comparison of two groups.

As the scoring of the Communication DEALL checklist is directly proportional to performance, the high mean value indicates better performance. From the figure 2, it can be understood that group A1 and B1 showed

greater scores for developmental domains such as speech and language domain, cognitive domain and social domain, as lower mean value indicates poorer performance, in the group A2 and B2, it can be seen that social domain is the most affected one followed by speech & language and cognitive domain.

The group A1 obtained a mean score of 100 for all the three domains and the mean score of group B1 for speech and language &cognitive domain was 99.9, and social domain was99.4. Group A1 and B1 showed greater mean values indicating better performance and group A2 and B2 showed lower mean values indicating poor performance on all the developmental domains of the Communication DEALL checklist. The mean score of group A2 for speech & language domain was 99.8, the

cognitive domain was 99.6 and social was 98.2 and group B2 for speech & language

domain was 99.02, the cognitive domain was 99.7 and social domain was 96.9.

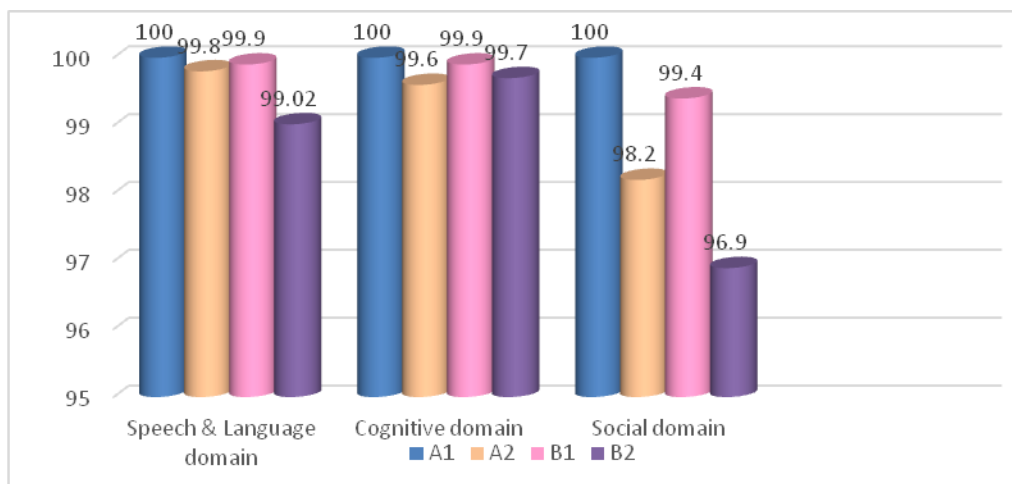


Figure 2: Mean(M) scores of group A1 & A2 and group B1 & B2 across each domain (Speech and Language, Cognitive, and Social, domain) of Communication DEALL checklist.

Mann Whitney test was used for the comparison of group A1 & A2 & group B1 & B2. Results indicated there was a statistically significant difference present

between-group A1 & A2 and group B1 & B2 in all the three domains of communication in communication DEALL checklist (Table 3).

Table 3: The Mean (M), Standard deviation(SD) and Mann Whitney U test results, of Communication DEALL checklist of group A1 (watching cartoon < 2 hour) & A2 (watching cartoon >2 hours) and of group B1 (watching non aggressive cartoon) & B2 (watching aggressive cartoons).

	Group	N	Mean	SD	Mann Whitney U test		
					Z	P	HS
Speech and Language Domain	A1	30	100.	2.56882	-4.415	.000	HS
	A2	34	99.8	1.40916			
	B1	30	99.9	.08445	-5.850	.000	HS
	B2	30	99.02	.60056			
Cognitive domain	A1	30	100.	1.27035	-4.415	.000	HS
	A2	34	99.6	3.50808			
	B1	30	99.9	.16147	-4.506	.000	HS
	B2	30	99.7	.37243			
Social domain	A1	30	100.	3.29768	-5.901	.000	HS
	A2	34	98.2	6.02527			
	B1	30	99.4	.93552	-5.360	.000	HS
	B2	30	96.9	1.37982			

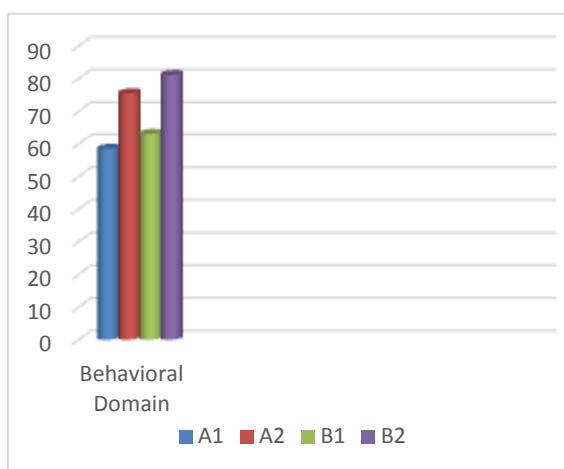


Figure 3: Mean (M) scores of ADHD T of groups A1 & A2 and B1 & B2

Mean and Standard deviation of ADHD T scores were calculated for both A1 & A2 and B1 & B2 group (Figure 3).

As the scoring of the ADHD T is inversely proportional to performance, the high mean value indicates poor performance. From the figure 3, it can be seen that group A1 and B1 showed low scores on ADHD T. Group A1 and B1 showed lesser mean value indicating better performance and group A2 and B2 showed higher mean values indicating poor performance on ADHD T-test material. The means score of group A1 is 58.5 and mean score of group B1 was 63.03. The mean

score of group A2 was 75.5 and group B2 was 81.1

Mann Whitney U test was used for the comparison of group A1& A2 and group

B1 & B2. Results indicate there was a statistically significant difference present between-group A1 &A2and B1 & B2 (Table 4).

Table 4: The Mean(M), Standard deviation(SD) and Mann Whitney U test results, of ADHD T test material of group A1 (watching cartoon < 2 hour) & A2 (watching cartoon >2 hours) and of group B1 (watching non aggressive cartoon) &B2 (watching aggressive cartoon).

	Group	N	Mean	SD	Mann Whitney U test		
					Z	P	HS
ADHD T	A1	30	58.5	.85836	-5.188	.000	HS
	A2	34	75.5	10.29030			
	B1	30	63.03	9.26426	-5.454	.000	HS
	B2	30	81.1	6.54998			

The statistical test result of developmental checklist and standardized test materials (DEALL &ADHD T) reveals that compared to control group, the children watching cartoons greater than two hours a day and children exposed to aggressive cartoons showed poor performance on all the four developmental domains. This states that the content and duration of cartoon viewing has an influence on developmental domains of communication in children aged4-6 years.

4. DISCUSSION

In the present study, the statistical test result of developmental checklist and standardized test materials (DEALL &ADHD T) reveals that compared to control group, the children watching cartoons greater than two hours a day and children exposed to aggressive cartoons showed poor performance on all the four developmental domains. And among all the four domains, behavioral domains followed by social domain were affected the most. These findings can be well correlated with the previous research studies.

There are an ample amount of studies which are in accordance with the present findings. Bandura, Ross & Ross, conducted a study and concluded that children who watched violent cartoons experienced higher aggression in their behavior⁵. Habib & Soliman, claimed that the violence that appears in a cartoon, cause an excessive increase in adrenaline production which causes unstable state of mind by which child begins to act nervously

and aggressively towards normal situations or during his playing time⁶.

Yousaf, Shehzad & Hassan, confirmed factors like the type of cartoons (aggressive / neutral), duration of watching and age of watching are the reasons for behavioral issues in children.⁷

According to Sudha, the factors like, respondents age, gender, siblings, standard, and time spent watching television have a significant relationship with their behavioral issues.⁸

Anderson stated that television programs and video games are clear cut evidence that violent contents will increase aggressive and violent behavior of youngsters in both short-term and long-term context.⁹ Moreover, marginalization of cognitive functions, and divergence from realities, and an increase of negative behavior might develop over the course of time

In the present study descriptive statistics shows that in social domain group B2 has higher mean value than group B1.This indicates that children watching aggressive cartoon shows poor performance in social domain. Among 10 questions in the social domain, majority of the children in Group A2 received high scores for the questions such as “Does he/she has difficulty keeping “on track” when telling other people something?” and “Does he/she has difficulty in realizing how to communicate in different social situations?”. Children who watch non aggressive cartoon and children who were

monitored by their parents while watching cartoons scored less on the rating scales.

Mares and Woodard studied children watching aggressive pro social content shows strong negative effects in the social interaction.¹⁰ Research suggested that children tended to be more aggressive in social interactions after viewing an aggressive animated cartoon. Siegel conducted a study, he took 36 children, half of them were boys and half of them were girls, all in the first grade. They exposed a group of the children to an aggressive cartoon, a group to a non-aggressive cartoon, and a group to no cartoon. The children were then brought to a room where a tester would ask certain questions. Their results found that subjects tended to be more aggressive in social interactions after viewing an aggressive animated cartoon than they were after viewing a neutral one.¹¹

The present study showed that children watching aggressive cartoon shows poor performance in speech and language domain. Among 10 questions in the speech and language domain, majority of the children in group B2 received high scores for the questions such as “Does he /she has difficulty in using past, present and future tenses?” and “Does he/she has difficulty to put together sentences of 4 -6 words?”. Children who watch non aggressive cartoon scored less on the rating scales. During the interactive sessions with parents/care givers of the subjects, reported that their children showed aggressive cartoon character’s body language and exhibited vocabularies of the cartoons they watched.

Furthermore, Linebarger and Walker conducted a study to check the relationship between vocabulary size and expressive language with television programs and frequency of television viewing among infants. Results indicate that viewing television before the age of 30 months will effect language development.¹² This is supported by Okuma and Tanimura, finding that delayed language development was found in young children with heavy television and video watching habit but in

contrast school going children showed an increase in language development.¹³

The findings of present study also indicated that children watching aggressive cartoon showed poor performance in cognitive domain.

Singer stated that frequent changes in scenes and content in television interrupt young children’s ability to sustain attention.¹⁴ Christakis et al., also stated that content is an important mediator between exposure to television and subsequent attention problems.¹⁵ Early exposure to violent and non-educational programming was positively associated with later symptoms of attention deficit but exposure to educational programs was not related to attention problems

According to Schmidt et al, television programs have been criticized for their negative influences on children’s cognitive development, especially when frequent changes in scenes and content create attention problems for children.¹⁶ Susan made the comparison between fast-paced television cartoon and slow-paced educational television shows has shown the empirical evidence that fast-paced cartoons immediately impaired young children’s Executive function (EF) more than the slow-paced ones.¹⁷

Since the results of the present study reveals that there is a significant difference between group B1 and group B2, in all the four developmental domains, it is clear that “content” is an important variable while discussing the impact of cartoon exposure on developmental domains of communication.

5. CONCLUSION

Like every aspects, cartoon also has its positive and negative impacts. When very young children are considered, its negative impact outweighs the positive impact. While watching cartoons only one sided communication takes place. For a well-developed social behavior to and fro interaction is very essential. According to Gentile, Lynch, Linder & Walsh, the rapidly

moving images on TV and video games may rewire the brains of very young children, making it difficult for them to focus on slower task that require more thought.¹⁸ They also claimed that Television viewing may, at least temporarily, idle the centers in the pre-frontal cortex that are responsible for organizing planning and sequencing thought

The present study indicates that content and duration of cartoon exposure are the two main variables which determine the impact of cartoon on developmental domains of communication. Majority of the parents reported that their children imitate the favorite cartoon character's behavior or extra ordinary actions. As a result of this child begins to act nervously and aggressively towards normal situations or during his play time. Speech & language domain and social domain also gets affected due to longer duration and aggressive content of cartoon viewing. By controlling these two (i.e., content and duration) variables parents can prevent the negative impact of cartoon exposure on child's overall development.

Similar suggestions were given by American Academy of Pediatrics (AAP).¹⁹ They provide the evidence-based tools and recommendations for parents to help them make their children's media experience a positive one. AAP recommendations include:

- For children younger than 18 months, avoid use of screen media other than video chatting. Parents of children 18 to 24 months of age who want to introduce digital media should choose high quality programming, and watch it with their children to help them understand what they're seeing.
- For children ages 2 to 5 years, limit screen use to 1 hour per day of high quality programs. Parents should co-view media with children to help them understand what they are seeing and apply it to the world around them.
- For children ages 6 and older, place consistent limits on the time spent using

media, and the types of media, and make sure media does not take the place of adequate sleep, physical activity and other behaviors essential to health.

This study can be used as a reference for creating awareness among parents about the impact of cartoon exposure on child's early development. To make cartoons a healthy entertainment and a good and effective source of learning for children, parents must control the time that children spend and also should pay more attention in providing selected cartoons to their children which could have a positive impact on them. Though media helps in acquiring knowledge, there is a hidden danger in them which hamper children from exploring, experiencing and achieving more natural way of communication that can mould them in to a greater personality. As future directions similar study can be carried out in larger sample size and also a comparison study with different age group which may indicate how each domain affect in children.

Let's protect our children from the negative impact of the media! Healthy kids, Healthy future!

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APPENDIX I

HILD DEVELOPMENT PARENT/CAREGIVER QUESTIONNAIRE (4-6 YEARS)

Name of the child:

Age/ Gender:

Year level at school:

Parent Name:

Phone number:

School attended:

PART- A QUESTIONS

QUESTIONS	RESPONSES
1) Does your child watches cartoon	Yes / No
2) How long does your child watches cartoons	<2 hours / >2 hours
3) Do you monitor your child while watching cartoon	Yes / No
4) Which type of cartoon is your child interested to watch	Aggressive / Non-aggressive
5) Does your child imitate the cartoon characters	Yes / No

PART- B QUESTIONS

CHECKLIST FOR ASSESSING DOMAINS OF COMMUNICATION

INSTRUCTIONS: Please circle 4 if the item is very true (consistently present) for the child. Circle 3 if the item is usually present for the child. Circle 2 if the item is sometimes true for the child. Circle 1 if the item is rarely true for the child. Circle 0 if the item is not true for the child. Please answer all the items.

CHECKLIST FOR ASSESSING SPEECH AND LANGUAGE DOMAIN

Never:0 Rarely:1 Sometimes:2 Usually:3 Consistently:4

1. Does he/she have difficulty in using 'Wh' questions	0	1	2	3	4
2. Does he/she have difficulty to read and write alphabets (4-5 years) and words (5-6 years)	0	1	2	3	4
3. Does he/she have difficulty to produce grammatically correct spontaneous utterances	0	1	2	3	4
4. Does he/she have difficulty in using past, present and future tenses	0	1	2	3	4
5. Does he/she have difficulty to put together sentences of 4-6 words	0	1	2	3	4
6. Does he/she have difficulty in understanding gist and moral of the story	0	1	2	3	4
7. Does he/she speaks with a monotonous or strange voice (unable to use intonation appropriately)	0	1	2	3	4
8. Does he/she have difficulty telling about experiences or situations	0	1	2	3	4
9. Does he/she have difficulty in retelling a story in detail	0	1	2	3	4
10. Does he/she have difficulty in responding appropriately when asked about something	0	1	2	3	4

CHECKLIST FOR ASSESSING SOCIAL DOMAIN

Never:0 Rarely:1 Sometimes:2 Usually:3 Consistently:4

1. Does he/she have an inadequate eye contact in face to face situations	0	1	2	3	4
2. Does he/she has difficulty to make requests, greetings/farewell and comments	0	1	2	3	4
3. Does he/she show less interest in conversation with others (doesn't initiate conversation, doesn't answer to questions etc.)	0	1	2	3	4
4. Does he/she shows less interest to interact with peers (sharing, turn taking, discuss, ask and answer questions)	0	1	2	3	4
5. Does he/she have difficulty responding to the needs of other people	0	1	2	3	4
6. Does he/she have difficulty in realizing how to communicate in different social situations.	0	1	2	3	4
7. Does he/she have difficulty in group activities or games	0	1	2	3	4
8. Does he/she have difficulty in waiting for one's turn (in games, during meals, during conversation)	0	1	2	3	4
9. Does he/she have difficulty in keeping "on track" when telling other people something	0	1	2	3	4
10. Does he/she have difficulty in understanding the concept of right and wrong	0	1	2	3	4

CHECKLIST FOR ASSESSING COGNITIVE DOMAIN

Never:0 Rarely:1 Sometimes:2 Usually:3 Consistently:4

1. Does he/she have difficulty to understand the meaning of warning, anger or friendly voices	0	1	2	3	4
2. Does he/she have difficulty sustaining attention in tasks or play activities (sitting through an entire lunch/dinner, sitting/listening to an entire story etc.,)	0	1	2	3	4
3. Does he/she have difficulty to make inferences (eg: girl was playing outside and got wet when came back. What was happening outside?)	0	1	2	3	4
4. Does he/she have difficulty acquiring new skills, such as rules of new play or games	0	1	2	3	4
5. Does he/she have difficulty in following long or multiple-step instructions	0	1	2	3	4
6. Does he/she have difficulty to interpret the feelings of others.	0	1	2	3	4
7. Does not have the concept of time (morning, noon, night)	0	1	2	3	4
8. Does he/she have difficulty matching symbols, letters and numbers	0	1	2	3	4
9. Does he/she have difficulty to recite rhymes, sing songs etc.	0	1	2	3	4
10. Does he/she have difficulty to understand how his/her behaviour affects others	0	1	2	3	4

CHECKLIST FOR ASSESSING BEHAVIORAL DOMAIN

Never:0 Rarely:1 Sometimes:2 Usually:3 Consistently:4

1. Does he/she imitates favorite cartoon character's behavior or extra ordinary actions	0	1	2	3	4
2. Does he/she shows difficulty to remain seated	0	1	2	3	4
3. Does he/she starts fighting with other children without any reason	0	1	2	3	4
4. Does he/she reacts in an aggressive manner when teased	0	1	2	3	4
5. Does he/she demonstrate more attention seeking behaviors than his/her peers.	0	1	2	3	4
6. Does he/she have difficulty in showing emotional attachment with parents, teachers and friends	0	1	2	3	4
7. Does not seem to feel badly even after misbehaving	0	1	2	3	4
8. Does he/she scares other children to get what he/she wants	0	1	2	3	4
9. Does he/she blurts out answers before the question has been completed	0	1	2	3	4
10. Does he/she have difficulty to maintain an established sleeping schedule	0	1	2	3	4

APPENDIX- II

ATTENTION- DEFICIT/ HYPERACTIVITY DISORDER TEST (ADHD T)

Directions: please indicate which of the following behaviour is a problem for this individual. Mark or circle 0 if the behavior is not a problem or if you had the opportunity to observe the behavior, mark or circle 1, if the item refer to a behavior that is mild problem. Mark or circle 2 if the item refer to a behavior that is a severe problem for this individual. Do not skip any items.

Hyperactivity Subtest		Not a problem	Mild problem	Severe problem
1	Loud	0	1	2
2	Constantly "on-the-go"	0	1	2
3	Excessive running, jumping, climbing	0	1	2
4	Twisting and wiggling in seat	0	1	2
5	Easily excited	0	1	2
6	Grabs objects	0	1	2
7	Excessive talking	0	1	2
8	Difficulty remaining seated	0	1	2
9	Constantly manipulating objects	0	1	2
10	Inability to play quietly	0	1	2
11	Fidgets	0	1	2
12	Restless	0	1	2
13	Squirms	0	1	2

Hyperactivity Sum

Impulsivity Subtest		Not a problem	Mild problem	Severe problem
14	Acts before thinking	0	1	2
15	Shifts from one activity to the next	0	1	2
16	Fails to wait for one's turn	0	1	2
17	Difficulty waiting turn	0	1	2
18	Blurts out answers	0	1	2
19	Impulsive	0	1	2
20	Interrupts conversations	0	1	2
21	Intrudes on others	0	1	2
22	Does not wait for directions	0	1	2
23	Fails to follow rules of games	0	1	2

Impulsivity Sum

Inattention Subtest		Not a problem	Mild problem	Severe problem
24	Poor concentration	0	1	2
25	Fails to finish projects	0	1	2
26	Disorganized	0	1	2
27	Poor planning ability	0	1	2
28	Absentminded	0	1	2
29	Inattentive	0	1	2
30	Difficulty following directions	0	1	2
31	Short attention span	0	1	2
32	Easily distracted	0	1	2
33	Difficulty sustaining attention	0	1	2
34	Difficulty staying on task	0	1	2
35	Difficulty completing tasks	0	1	2
36	Frequently loses things	0	1	2

Inattention Sum

APPENDIX-III

Communication DEALL (Developmental Eclectic Approach to Language Learning) Checklist

a) Gross Motor skills

Age Range	Group	Item No	Items
66-72 months	XII	36	Hangs from horizontal bar bearing own weight on arms.
		35	Stands on one foot with no support and eyes closed.
		34	Picks up object from ground while running.
60-66 months	XI	33	Rides on bicycle.
		32	Catches soft ball with one hand.
		31	Climbs stepladders or steps 10 feet high to the slide.
54-60 months	X	30	Can participate in bat and ball games successfully.
		29	Uses legs with good strength and ease.
		28	Walks on a balance board with support.
48-54 months	IX	27	Hops.
		26	Runs changing direction.
		25	Swings independently.
42-48 months	VIII	24	Moves backward and forward with agility.
		23	Increased skill in ball games – throws, catches, bounces and kicks with an idea of where the ball is going.
		22	Runs around obstacles.
36-42 months	VII	21	Swings on swing when set in motion.
		20	Goes up stairs and down stairs without support.
		19	Runs and plays active games.
30-36 months	VI	18	Un wraps small objects.
		17	Rolls clay balls.
		16	Performs running and jumping activities confidently.
24-30 months	V	15	Throws a ball overhead.
		14	Tries to catch a large ball.
		13	Jumps off floor with both feet.
18- 24 months	IV	12	Runs fairly well.
		11	Walks up and down the stairs with help.
		10	Able to get on to chairs without assistance.
12-18 months	III	9	Throws ball forward.
		8	Bends down forward.
		7	carries, pushes or pulls toys / objects.
6-12 months	II	6	Claps hands.
		5	Bounces when held standing.
		4	Crawls / creeps.
0-6 months	I	3	Raises head and shoulder from a face down position.
		2	Watches own hand.
		1	Eyes follow moving object or person.

a. Fine Motor skills

Age Range	Group	Item No	Items
66-72 months	XII	36	Likes to disassemble objects / dress and undressed dolls.
		35	Colors within lines.
		34	Prints numerals 1 to 5.
60-66 months	XI	33	Can copy small letters.
		32	Able to fold the paper in to two halves.
		31	Uses fingers and wrist appropriately to write.
54-60 months	X	30	Makes precise marks with crayon confined to small area.
		29	Reaches and grasps in one continuous movement.
		28	Enjoys manipulating play objects that have fine parts.
48-54 months	IX	27	Enjoys art projects such as pasting and stringing beads.
		26	Winds up toy by turning knob.
		25	Begins to copy some capital letters.
42-48 Months	VIII	24	Participates in songs and finger play, both familiar and new ones.
		23	Good control of pencil which is held like adults.
		22	Manipulates clay materials (rolls, balls, snakes etc).

<i>Table continued</i>			
36-42 months	VII	21	Opens rotating door handles.
		20	Holds crayon with thumb and finger.
		19	Tries new art media such as chalk with eagerness and an exploratory attitude.
30-36 months	VI	18	Rolls, pounds, squeezes and pulls clay.
		17	Pours liquids with some spills.
		16	Uses one hand consistently in most activities.
24-30 months	V	15	Makes own designs or spontaneous forms in drawing.
		14	Turns one page at a time.
		13	Opens doors.
18- 24 months	IV	12	Can pick thread, pins.
		11	Opens cabinets, drawers and boxes.
		10	Scribbles spontaneously.
12-18 months	III	9	Points to recognized objects.
		8	Picks up crumbs from floor.
		7	Able to hold and manipulate objects with both hands together.
6-12 months	II	6	Bangs objects on table.
		5	Reaches and takes object placed at a distance.
		4	Attempts to play with tiny objects like bottle lid / piece of paper.
0-6 months	I	3	Clenches immediately when something is placed on medial side of the palm.
		2	Puts everything in mouth.
		1	Clenches fist.

b. Activities of Daily Living

Age Range	Group	Item No	Items
66-72 Months	XII	36	Develops strong food preference.
		35	Finds correct bathroom in public.
		34	Uses phones.
60-66 Months	XI	33	Shows interest in household activities.
		32	Performs simple cleaning.
		31	Cuts soft food.
54-60 Months	X	30	Performs routines without assistance.
		29	Combs and brushes hair.
		28	Throws pieces of paper and rubbish in to the waste paper basket.
48-54 Months	IX	27	Ready to learn table manners.
		26	Pulls zipper up and down with ease.
		25	Begins to be selective about what to wear.
42-48 Months	VIII	24	Pour juice from a small pitcher and stop before the juice overflows.
		23	Washes hands independently.
		22	Knows how to use handkerchief.
36-42 months	VII	21	Feeds self with little spilling.
		20	Able to use hands to accomplish many self help tasks.
		19	Wipes nose when reminded.
30-36 Months	VI	18	Serves self at table with little spilling.
		17	Insists on doing things independently.
		16	Knows proper place for own things.
24-30 Months	V	15	Wipes nose if given towel.
		14	Able to hold spoon with fingers appropriately.
		13	Pulls pants up with assistance.
18- 24 Months	IV	12	Gives empty dish to adults.
		11	Able to swallow mixed textures.
		10	Uses palm and fingers to fill and eat with spoon.
12-18 Months	III	9	Lifts and drinks from cup / drinks from a sipper.
		8	Indicates discomfort over soiled pants verbally or by gesture.
		7	Removes cap.
6-12 Months	II	6	Swallows with mouth closed.
		5	Holds own bottle.
		4	Eats mashed food.
0-6 months	I	3	Opens and closes mouth in response to food stimulus.
		2	Coordinates sucking swallowing and breathing.
		1	Sucks finger when placed between the lips.

c. Receptive Language

Age Range	Group	Item No	Items
66-72 months	XII	36	Understands TV commercials.
		35	Listens to another speaker if information is new and of interest.
		34	Has an awareness of socially appropriate uses of communication.
60-66 months	XI	33	Understands some jokes, surprise, make-believe / pretend.
		32	Understands time sequences (what happened first, second, third, etc).
		31	Understands more quantity concepts (whole, half).
54-60 months	X	30	Knows secondary colors such as pink, brown etc.
		29	Understands opposites.
		28	Understands sequencing of events.
48-54 months	IX	27	Knows difference between top and bottom.
		26	Understands complex directions e.g., Point to a dog that is black /sleeping / in the box.
		25	Hears and Understands most of what is said at home and in school.
42-48 Months	VIII	24	Understands words that relate one idea to another if, why, when.
		23	Understands "now" "soon" and "later".
		22	Understands number and space concepts – more, less, bigger, in, under, behind.
36-42 months	VII	21	Identifies hard / soft.
		20	Understands directions words – responds to directional words such as around, backward, forward.
		19	Understands three – step directions, such as, "Please pick up your book From the floor and put it on the top shelf".
30-36 months	VI	18	Shows interest in the 'how' and 'why' of things.
		17	Understands common adjectives – nice, pretty, hot.
		16	Understands propositions such as 'on', 'under', 'front', 'behind', etc.
24-30 months	V	15	Can name objects when told their use for e.g. "something that you cut with".
		14	Understands the meaning of kinship term like 'grandma' 'uncle' 'aunty'.
		13	Understands the meaning of most common verbs like 'eat' 'drink' 'sleep' 'wash' etc.
18- 24 months	IV	12	Listens to short rhymes.
		11	Recognizes names of familiar people and objects.
		10	Listens as pictures are named.
12-18 months	III	9	Responds accurately to action commands like "sit down" and "stop that".
		8	Selects and brings familiar objects from another room when asked.
		7	Follows simple one step commands e.g., Get your toy.
6-12 months	II	6	Understands 'no' and 'bye bye'.
		5	Appears to listen to conversations between others.
		4	Pays some attentions to music / songs.
0-6 months	I	3	Comforted by a friendly familiar voice.
		2	Looks at you with interest when you talk to him.
		1	Startle response to sudden loud noise.

d. Expressive Language

Age Range	Group	Item No	Items
66-72 months	XII	36	Remember lines of simple poems, repeats full sentences and expressions from others.
		35	Socialized speech begins – children talk about other people as well As about themselves.
		34	Remembers lines from television shows and commercials.
60-66 months	XI	33	Uses all sounds correctly.
		32	Names 3 basic shapes.
		31	Names 6 basic colors.
54-60 months	X	30	Asks meaning of words.
		29	Possessive pronouns "his, her" emerging.
		28	Responds appropriately to "how often" and "how long" question.
48-54 months	IX	27	Can control of voice for periods of time if reminded.
		26	Likes to tell others about family and experience.
		25	Learns new vocabulary quickly if related to own experience.
42-48 Months	VIII	24	Conjunction "because" are emerging.
		23	Reflective pronouns "myself" emerging.
		22	Appropriately answers "what if" questions.
36-42 months	VII	21	Correct others.
		20	Requests permission.
		19	Answers 6 – 7 agent / action questions like "why are you running".

<i>Table Continued</i>			
30-36 months	VI	18	Answers "who" questions.
		17	Answers "where" questions.
		16	Uses several verb forms – eating, drinking, sleeping, etc.
24-30 months	V	15	Uses 2 word combinations (Me go, more bikki).
		14	Name 3 pictures.
		13	Asks for help with personal needs such as "wash hands", "do susu".
18- 24 months	IV	12	Says name of toys.
		11	Names 3 pictures.
		10	Will use "no, not"
12-18 months	III	9	Protests when frustrated.
		8	Asks for something by pointing or by using one word.
		7	Chatters continuously while playing.
6-12 months	II	6	Attempts to communicate his / her intentions.
		5	Vocalizes loudly / Shouts for attention.
		4	Babbles series of sounds that 'sounds' like speech.
0-6 months	I	3	Makes sucking sounds.
		2	Uses vocal expressions of pleasure when played with.
		1	Shows random vocalization other than crying.

e. Cognitive Skills

Age Range	Group	Item No	Items
66-72 months	XII	36	Arranges objects in sequence of width and length.
		35	Sight reads 10 printed words.
		34	Says letter of alphabet in order.
60-66 months	XI	33	Prints own first name.
		32	Counts up to 20 items and tells how many.
		31	Interested in environment, city, shops, etc.
54-60 months	X	30	Retells five facts from story heard 3 times.
		29	Matches symbols / letters and numerals.
		28	Tells what's missing when one object / picture is removed from a group of three.
48-54 months	IX	27	Tells whether objects are heavier / lighter (lesser weight).
		26	Understands daily routines and sequences in correct order.
		25	Recalls 4 objects seen in a picture.
42-48 Months	VIII	24	Tells which objects go together.
		23	Can count meaningfully to 5 (if you place 5 apples on a table and ask to count them, she / he will be able to count those 5 apples).
		22	Can recall a three step direction such as, "go find the ball and bring it to me".
36-42 months	VII	21	Points to long and short objects.
		20	Learns through observation and adult explanation.
		19	Enjoys pretend play.
30-36 months	VI	18	Chooses pretend play.
		17	Concentrates on activities of choice such as putting objects into a bottle.
		16	Enjoys floor play with bricks, boxes etc. which can be used imaginatively.
24-30 months	V	15	Little understanding of the need to wait for something – including attention.
		14	Knows where things usually belong.
		13	Plays with water and sand (filling and emptying).
18- 24 months	IV	12	Recognizes self in photograph.
		11	Very curious about surrounding but has little understanding of common dangers.
		10	Enjoys picture books and recognizes smaller details.
12-18 months	III	9	Puts a lid on a pot.
		8	Identifies self in mirror.
		7	Reacts to various sensations such as extremes in temperature and taste, textures.
6-12 months	II	6	Looks for an object he / she watched fall out of sight (such as a Spoon that falls under the table).
		5	Explores objects in many different ways (shaking, banging, throwing, dropping, finds functional side).
		4	Plays 2 -3 minutes with a single toy.
0-6 months	I	3	Recognizes mother.
		2	Focuses on colorful and moving objects.
		1	Recognizes bottle or breast.

f. Social Skills

Age Range	Group	Item No	Items
66-72 months	XII	36	Enjoys school.
		35	Enjoys social gatherings.
		34	Knows about giving, receiving, sharing, and playing fairly.
60-66 months	XI	33	Joins in conversation at mealtime.
		32	Chooses own friend.
		31	Can follow request.
54-60 months	X	30	Engages in socially acceptable behavior in public.
		29	Plays with both boys and girls but prefers the same sex.
		28	Organizes other children and toys for pretend play.
48-54 months	IX	27	Prefers to play with other children, is competitive.
		26	Shows more independence and wants to do things alone.
		25	Develops friendships.
42-48 Months	VIII	24	Follows rules in group games led by adult.
		23	Likes group activities and time with friends.
		22	Use imaginative play.
36-42 months	VII	21	Spends a great deal of time in watching and observing.
		20	Spontaneously shows affection for familiar playmates.
		19	Plays well with others and responds positively if there are favorable conditions in terms of materials, space and supervision (less likely to engage in prosocial behavior when any of these elements are lacking).
30-36 months	VI	18	Makes a choice when asked.
		17	Says please and thank you when reminded.
		16	Participates in circle games; plays interactive games.
24-30 months	V	15	Enjoys experimenting with adult activity.
		14	Plays side by side with other children.
		13	Wants to help and please.
18- 24 months	IV	12	Begins to be helpful, such as by helping to put things away.
		11	Interacts with peers using gestures.
		10	Engages in parallel play.
12-18 months	III	9	Plays ball cooperatively.
		8	Waves bye-bye.
		7	Plays with other children; seeks interactions with other children.
6-12 months	II	6	Prefers mother and / or regular caregiver over all others.
		5	Generally friendly.
		4	Holds arms up to be lifted.
0-6 months	I	3	Responds to primary caregiver by smiling.
		2	Pats and pulls at adult facial features (hair, nose, glasses) etc.
		1	Looks at human faces.

g. Emotional Skills

Age Range	Group	Item No	Items
66-72 months	XII	36	Begins to cope constructively with various emotional states: rejection, Disappointment, failure, frustration, success, excitement.
		35	Sense of safety and belonging is important.
		34	Senses growing up and likes it.
60-66 months	XI	33	Tells exactly how he feels: sick, happy, or miserable.
		32	Can easily show love and affection and this does not embarrass him.
		31	Enjoys playing age appropriate games but tends to be more Competitive and wants to win.
54-60 months	X	30	Begins to develop a sense of fairness, e.g., taking turns, sharing a treat.
		29	Demonstrates growing confidence in a range of abilities.
		28	Has good sense of "mine" and "yours".
48-54 months	IX	27	Increasingly expresses a sense of self in terms of abilities, characteristics, preferences, and actions e.g., "Look at me! I'm building a castle".
		26	Enjoys obedience and thrives on praise.
		25	Learns to develop attitudes concerning right and wrong.
42-48 Months	VIII	24	Can identify his own feelings.
		23	Likes talking and word games.
		22	Enjoys music.
36-42 months	VII	21	Develops a sense of humor, can laugh at self and others when small accidents happen.
		20	Labels own feelings and those of others' based on their facial expression / tone of voice (looks at a picture in a book and says, "she's scared").
		19	Understands, at least on a basic level, that feelings have causes (e.g., says, "sunny is sad because he can't find his blanket.").

<i>Table Continued</i>			
30-36 months	VI	18	Shows sympathy.
		17	Just beginning a sense of personal identity and belongings.
		16	Takes pride in achievements (e.g., I washed my hands by myself, or I did the puzzle myself).
24-30 months	V	15	Takes pride in clothing.
		14	Recognizes feelings when emotions are labeled by adult (e.g., teacher says, "I know you fell scared about that," and the child calms a bit).
		13	Increases his or her understanding and use of language related to emotions (e.g., says, "mummy's happy now.>").
18- 24 months	IV	12	Demands parents' attention.
		11	Curious about everything.
		10	Shows preferences of likes and dislikes.
12-18 months	III	9	Expresses appropriate emotions.
		8	Shows pleasure when familiar adults are nearby.
		7	Actively seeks comfort in a person or object when distressed.
6-12 months	II	6	Shows anger when toy is taken away.
		5	Laughs at funny faces.
		4	Smiles and laughs at baby games.
0-6 months	I	3	Moulds and relaxes body when held, cuddles.
		2	Cries to show discomfort or fatigue.
		1	Most content when near mother / caregiver.
