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Relationship between 3 to 5 Years Old Children's Screen Time and Parental Factors in Hong Kong

Abstract

The beginning age of using screen products among Hong Kong preschoolers was far earlier than the recommended age by the American Academy of Pediatrics (AAP), and a local survey showed that many Hong Kong children spent more than the recommended time by AAP. Some theories indicated that parents could effectively influence child's behaviors. This study is aimed to investigate the associations between parental factors and child's screen time. Question of 'What are the associations between parental factors (i.e. socioeconomic status, parents' screen using behavior and attitude) and 3-5 years old children's screen time in Hong Kong?' is discussed. Questionnaire is used to collect data from parents who have at least one 3-5 year old child. This study found that child's screen time was positively associated with parents' screen time and positive attitude on the impacts of digital devices, and also negatively associated with rules and had no association with SES. The importance of parent modeling and the promotion of education on using digital devices are addressed by the results.

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Nowadays, digital devices become an essential part of our life. Usually, people are looking at their phones or computers anytime and everywhere, such as waiting for buses or having meals. Therefore, a word called ‘screen time’ existed in this generation to represent the using time of digital devices. The Canadian Pediatric Society (2017) defined ‘screen time’ as the time spent on any screen products, such as television, smartphones, tablets, video games, computers or wearable technology. They are widely used among people, from as young as toddlers to the elderly. Focusing on preschoolers, the Department of Health in Hong Kong (2017) found that in 2014, the median age at which children started watching television was eight months old, ten months old for DVD, sixteen months old for tablet PC, and twenty-four months old for computer. The same survey found that in 2017, the median commencement age for screen time increased slightly to twelve months old on using TV and DVD and eighteen months old on using tablet PC. Undoubtedly, even though the commencement age for using digital devices in 2017 was slightly later than in 2014, it was still earlier than that recommended by the American Academy of Pediatrics (AAP). They suggested the discouragement of media use for children younger than two years old (American Academy of Pediatrics, 2011).

The same survey also indicated the top three prevalence of using different digital devices among preschoolers. In 2014, the top three digital devices that are prevalently

used among preschoolers were TV, DVD and tablet PC ascendingly. Later in 2017, these top three prevalence of use was decreased. For example, TV was decreased from around eighty percent to seventy percent, digital video disc was decreased from forty percent to fourteen percent, while tablet computer was decreased from forty percent to twenty-five percent. Notably, smartphone was a new type of electronic devices that included in 2017 survey but not 2014. Interestingly, smartphone substituted DVD and became one of the top three prevalence of use among preschoolers (with TV and tablet PC). Apparently, reports by the Government indicated the early usage of digital products among Hong Kong children in recent years and highlighted the high prevalence of using TV, smartphone and tablet PC among preschoolers. These data showed the importance of awareness of children's screen time and behaviors.

For the current time spent on screen products among Hong Kong preschoolers, Lau, Ip, Wong and Ho (2017) conducted longitudinal research of media use and physical activity influences on Hong Kong children age 5 to 9. They found that among 7,585 children, 74.8% of them spent more than two hours per day on using digital devices, it was a higher proportion than Beijing and the United States (74.8%>47.4%>20.8%).

Because of the high prevalence of use of digital devices, a related study should be conducted to understand the factors that influence children's screen time to minimize

their screen viewing as equal as the recommended time length. This essay aims to investigate the relationship between parental factors and children's screen time. Parent attitudes, parent behaviors and children's screen time will be collected to examine their relationship.

The importance of parental influence on children

Children in early ages learn from the environment by observation. Through observing the surrounding, such as parents and family members, children imitate and mirror adults' behavior. These observations are described by the social learning theory (Bandura, 1977). Bandura stated that people learn from observing and imitating each other on how they behave, think and believe in. Through modeling and observation, 'reciprocal determinism' occurs when people's acts or thoughts influence each other. Therefore, as parents are one of the intimate roles in children's lives, children easily observe and remember parents' behaviors, and hence reproducing the actions by encoding their observation. Also, once children have a reason to imitate (eg. feeling satisfied when using digital-screen products) and without punishment (eg. limitation of screen time), they would be motivated to continue. In consequence, children keep acting like their parents, and from time to time, they might get used to it. In other words, if the parent uses digital-screen products usually, or they allow their children to watch on screen

without limitation, children's screen time might be affected according to parents' attitude or dependency.

In fact, another theory that supports the importance of parental factors on children's behavior would be the ecological systems theory by Bronfenbrenner (1986). Bronfenbrenner divided the ecological systems into four parts that the individual interacted with and each system also connected. Family is an example of the closest system from the individual, the microsystem. The microsystem directly impacts children's relationships with human and interpersonal interaction. Notably, parents' behavior could directly influence children's development in this system, for instance, parents' digital use and attitude on technology, including co-using of digital devices.

Effects of parents' screen time and attitudes on children's screen time

In the past, some studies indicated the influence of parents' screen time on children. Lauricella, Wartella and Rideout (2015) conducted a questionnaire on asking American parents' screen time on using TV, computer, mobile phone and tablet, as well as zero to eight years old children's screen time on using the same device. They figured out that parents' screen time was positively associated with children's screen time, no matter they were using TV, computer, mobile phone or tablet. Another investigation by Jago and colleagues (2014) explicitly indicated how father or mother's screening

viewing time on TV and computer affected child's use of those digital devices. The study found that when fathers watched more than two hours of TV per weekday, the children were 3.4 times more likely to exceed more than two hours watching TV. Similarly, the children were 3.7 times to watch more than two hours if the mothers exceed the time. Notably, on weekends, fathers could strongly influence the daughters on the time spent on TV, they were 7.9 times more likely to do so. For computer, the results showed that the computer time spent by father and mother was positively associated with child time spent. Especially, for fathers who spent more than half an hour per day increased the likeness of their daughter to engage in using computer by 3.5 times.

To conclude, these studies convincingly showed parents' time spent on digital devices could positively associate with children's screen time. Parents with heavier demand on digital devices are more likely to influence their children to spend a longer time on the same devices. Xu, Wen and Rissel (2015) summarized thirty articles about the association of parental influence with young children's screen time and physical activity. Nine of them that related to parents' use on TV pointed out the positive association with children's screen time. Apparently, the result was completely justified with sufficient evidence, it is no doubt that parents' behaviors affect children.

Effects of parents' attitudes on children's screen time

As we know that from Bronfenbrenner's theory, children's behaviors are influenced by parents, thus parents' attitudes should theoretically affect children's screen time. Nevertheless, there are constructs between different researchers.

From the positive side that parents' positive attitude towards digital devices would be related to longer children's screen time, and vice versa, negative attitude correlated to shorter children's screen time, Cingel and Krcmar (2013) provided evidence that parents' positive beliefs on educational media (e.g. educational programs, educational electronic toys and educational computer or video games) and non-educational media (e.g. DVD, handhelds, computer games, video games and Internet use) were positively associated with children's consumption on the mentioned devices, the more the agreement on the benefit from those devices, the longer the children's exposure on devices. To minimize the types of digital devices, Lauricella, Wartella and Rideout (2015) could be a suitable proof for this statement. They examined the relationship between parents' attitude and zero to eight years old children's use of TV, computer, smartphone and tablet PC. Their results indicated the positive association between parents' attitude and TV use in all ages, computer use in younger children, smartphone use and tablet use in older children.

On the other hand, some researchers also figured out the negative association or no association between parents' beliefs and children's screen time. Other than only investigated parents' positive beliefs, Cingel and Krcmar (2013) also asked parents about the concern of harming children's development by using media. Interestingly, there was no significant relationship between parents' negative beliefs and children's media use, except TV exposure. A survey conducted by Vandewater et al. (as cited in Xu, Wen and Rissel, 2015) did not support the negative association between 'TV hurts' and children's TV use (i.e. 'TV hurts' was not associated with decreased children's screen time).

Effects of parents' rules on using digital devices

Similarly, there are two sides to every coin. Hence, there were various researchers proved both positive and negative effect (or no effect) of parents' rules on children's screen time.

Setting time rules was a common way for reducing screen time. Xu, Wen and Rissel (2015) examined seven studies about TV time rules and found that the evidence for proofing the association between time rules and children's screen time was not much convincing. Four studies demonstrated a negative association between TV time rules and child's screen consumption, which meant setting TV time rules would result in less

screen consumption on TV. Downing, Hinkley & Hesketh (2015) also showed the effectiveness of time limitation on TV. If children's parents limited TV viewing time, boys' screen time spent 37 minutes less per day and girls spent 34 minutes less per day.

Nevertheless, some reports indicated there was positive or no effect of time limitation on children's TV time consumption. From the investigation of seven studies about TV time rules by Xu, Wen and Rissel (2015), they found that two studies illustrated there was no effect on children's screen time. Two studies were conducted by Hinkley, Salmon and Crawford (2013) and Vandewater et al. (2007). Former indicated that whether parents set TV time limits to preschoolers. child's screen time was compliant with the recommended screen time by AAP (i.e. less than two hours per day), while later found that TV time rules were not efficient in predicting the likeness of exceeding recommended screen time by AAP. Gubbels et al. (2011) surprisingly concluded the negative influence of restriction on sedentary behavior among children aged five (e.g. restriction on watching too much TV or playing too many computer games), which meant the restriction resulted in more sedentary time.

Effect of socioeconomic status (SES) on children's screen time

Researches indicated that SES could somehow influence children's screen time indirectly. For instance, Tandon et al. (2012) chose TV, DVD player and video game

as the examined types of digital devices and the result showed that children's screen time was higher in low-SES families. The reasons behind were home setting and restriction of outdoor activities in low-SES households. The report indicated the number of families that equipped digital devices (e.g. TV and video game system) in child's bedroom was higher in low-SES households and more restrictions on outdoor activities on low-SES families because of the concern of neighborhood safety. Carson, Rosu and Janssen (2014) also presented the result of the negative association between family SES and screen time in children.

Again, similar to the results about the effect of attitude and parents' rules, there was a study showed no or positive association between SES and screen time. Downing, Hinkley & Hesketh (2015) figured out that SES was negatively associated with three to five years old girls' screen time but no association on boys. Mozafarian et al. (2017) even pointed out the positive relationship between two variables among children aged six to twelve.

Research Question and Hypothesis

After reviewing some literatures, there are some gaps between previous studies and the present study.

Incomprehensive of choosing digital devices: Most of the past researches focused on examining TV, DVD, computer and video games, the devices were too outdated to examine the new generation. Refer to the research done by the Department of Health in Hong Kong (2017), smartphones became one of the most prevalent electronic devices. Therefore, newer technologies such as smartphones and tablets should be included in the present study.

Wide range of age group: There was only one study that covered newer technologies, they included smartphones, tablet TV and computer. Nonetheless, the age group in this study was too wide. Older children are more likely to own their mobile devices and it may influence the result.

Cultural and environmental difference in Hong Kong: All the literature mentioned are not based on the Hong Kong situation, the result may be different from those studies. Especially, one study showed that child's screen time was higher in low-SES households because of neighborhood safety. This study was established in the United States, culture and community safety may be dissimilar to Hong Kong. Consequently, the result may not be applicable in Hong Kong situation.

Therefore, recent study focuses on three to five years old Hong Kong preschoolers' screen time and parental factors, such as parents' screen time, parents' attitude on

impacts of digital devices, parents' rules and SES. Moreover, newer technologies such as smartphones and tablets would be included in this study. The research question of this study is 'What are the associations between parental factors (i.e. socioeconomic status, parents' screen using behavior and attitude) and 3-5 years old children's screen time in Hong Kong?'.

As the four factors will be investigated in this study, four hypotheses are established:

H1: Parents' screen time is positively associated with 3-5-year-old children's screen time.

H2: Parental attitude on the impacts of digital devices is positively associated with children's screen time.

H3: Parental attitude on the restriction of digital devices is negatively associated with children's screen time.

H4: SES is negatively associated with children's screen time.

Methodology

Participants

90 Hong Kong parents who own at least one child aged three to five years old would be recruited for participating in this study. There was no limitation regarding their religion, gender, SES level or other factors. There would be only one parent and one child in each family to involve in this study. Non-probabilistic sampling method was used in this research. Convenience sampling and snowball sampling would be adopted. The questionnaire was distributed to relatives who owned a child aged between three to five and then further forwarded to other parents that met the requirement.

Instrument

Quantitative research: Survey was the only instrument in collecting the data in this research. An online questionnaire was created by Google Forms and sent out via an instant messaging application WhatsApp. The questionnaire included four parts: (1) family background and SES, (2) parents and children's screen time, (3) parental attitude on the impact of digital devices, and (4) parental attitude on rules of digital devices (See Appendix 1 for the questionnaire sample).

Family background and SES: Six questions were asked as personal information and family background, including the relationship with child, child age, occupation, marital status, education level and monthly income. Among these questions, occupation, education level and monthly income would be scored based on the Hollinghead's four factor index of social status (Hollinghead, 1975). For occupation, the categorization was referred to the list from Hollinghead's four factor index of social status and rated 1 to 9. Education level was classified into six levels, from primary or below to master or above, and rated in 1 to 6. Monthly income was split into eight ranges, from $10,000 or below to $120,001 or above, and rated in 1 to 8. Finally, the scores from each participant would be added up to generate their SES score.

Parents and children's screen time: Question of 'Within the past two weeks, your/ your child average daily time spent on using electronic devices (including smartphone, computer, TV and tablet) is?' was asked and participants were required to fill a number to represent their time consumption on those devices.

Parental attitude on the impact of digital devices: Questions were adapted from the same survey questions by Lauricella, Wartella & Rideout (2015). Parents were asked about how much they agree on the beneficial impact of electronic devices on six child development, such as reading, speaking and social skill (See Appendix 1 for the

question table about the attitude on impacts of digital devices). Each item was scored in 1 to 4, from totally disagree, partly disagree, partly agree and totally agree. Eventually, the total score would be sum up for further analysis.

Parental attitude on rules of digital devices: Three questions were based on the advices for preschool parents from The National Association for the Education of Young Children (NAEYC) (n.d.). Question of 'I will limit my child's time spent on digital devices' was rephrased from the advice of 'Create boundaries', which suggested parents set limits to their children. Question of 'I request my child to use digital devices with my company' was referred to the co-using concept of 'Be involved', and 'My child needs to request my permission before using digital device' was based on 'It's okay to say no'. These questions would be rated 1 to 4 according to the frequency, from never, seldom, sometimes to always. Equals to the previous parts, the total score would be calculated for analysis.

Procedure

The consent form was attached to the front page of the online questionnaire. Target parents were required to read the consent form and to ensure some statements before completing the survey. The collection of data stopped two weeks after the first questionnaire was sent. Researcher organized data and calculate the scores through

Microsoft excel and analyzed the data by a statistical software called Statistical Product and Service Solutions (SPSS).

Analytical Plan

This study aimed to discover the associations between children's screen time and parental behaviors and attitudes. One-way influence was assumed in this study (i.e. children's screen time was affected by parents but not mutually influenced each other). Therefore, the result was analyzed by multiple regression analysis. The dependent variable was child's screen time, while the independent variables were parents' screen time, parental attitude on the impact, parental attitude on rules and SES. The associations among all variables were presented on tables.

Results

Demographic

57 parents completed the questionnaire. There were 70% of mothers and 30% of fathers. For marital status, 93% of them were married, 5% of them were not married. For education level, 3% of them were primary level or below, 11% of them were middle school level, 42% of them were high school level, 16% of them were college level, 25%

of them were bachelor level and 3% of them were master level or above (see table 1 for the summary of participant gender, marital status and education level).

Item(s)	Amount (N=57)	Percentage (%) (cor. to integer)
Relationship with child		
Mother	40	70
Father	17	30
Marital status		
Not married	1	2
Married	53	93
Divorced	3	5
Education level		
Primary or below	2	3
Middle school	6	11
High school	24	42
College	9	16

Bachelor	14	25
Master or above	2	3

Table 1: Summary of participant's relationship with child, marital status and education level

For occupation, there were 9 types of occupational categories. 21% of them belonged to type 1, 14% of them were type 2, 21% of them were type 3, 3% of them were type 4, 9% of them were type 5, 7% of them were type 6, 16% of them were type 7, 5% of them were type 8 and 4% of them were type 9 (see table 2 for the statistic of participants' occupation and explanation of the occupational types).

Type of occupation	Amount (N=57)	Percentage (%) (cor. to integer)
Type 1	12	21
Type 2	8	14
Type 3	12	21
Type 4	2	3
Type 5	5	9

Type 6	4	7
Type 7	9	16
Type 8	3	5
Type 9	2	4

Type 1: farm laborers or menial service workers; Type 2: unskilled workers; Type 3: machine operators and semiskilled workers; Type 4: smaller business owners, skilled manual workers, craftsmen and tenant farmers; Type 5: clerical and sales workers, small farm and business owners; Type 6: technicians, semiprofessionals, small business owners; Type 7: smaller business owners, farm owners, managers, minor professionals; Type 8: administrators, lesser professionals, proprietors of medium sized businesses; Type 9: higher executives, proprietors of large businesses, and major professionals

Table 2: Statistic of participants' occupation

For monthly income, most of the participants earned Hong Kong Dollar $10,001 to $20,000 monthly, and none of them earned more HKD $80,001 or above (see table 3 for the summary of participants' monthly income).

Monthly income	Amount (N=57)	Percentage (%) (cor. to integer)
$10,000 or below	4	7
$10,001-$20,000	25	44
$20,001-$40,000	19	33

$40,001-$60,000	8	14
$60,001-$80,000	1	2
$80,001-$100,000	0	0
$100,001-$120,000	0	0
$120,001 or above	0	0

Table 3: Summary of participants' monthly income

For child age, 21% of children were 3 years old, 39% of them were 4 years old and 40% of them were 5 years old. The mean age of children was 4.19 (see table 4 for the summary of child age).

Child age	Amount (N=57)	Percentage (%) (cor. to integer)
3	12	21
4	22	39
5	23	40

Table 4: Summary of child age

SES

After the addition of scores of occupations, education level and monthly income, SES level was split into relatively low-SES and relatively high-SES by the mean of the total score (rounded up to 12 instead of using 11.5). The proportion of relatively high-SES and relatively low-SES was 35% and 65% respectively (see table 5 for the proportion of SES).

Group of SES	Amount (N=57)	Percentage (%)	Mean score (cor. to 2 d.p.)
Relatively low	37	65	7.59
Relatively high	20	35	14.8

Table 5: Proportion of SES

Parents and children's screen time

Parents and children's average daily screen time within two weeks were self-reported by parents themselves. Among the group of three years old, the parents' mean of time on using digital devices was 3.75 hours, and the mean of their three years old children's screen time was 2.42 hours. In the four years old group, parents' mean time was 4.55 hours and the mean time of children aged four was 2.86 hours. For the group of five

years old, parents' mean of screen time was 4.57 hours and the mean of children's screen time was 3.39 hours. Generally, within all parents, their mean of screen time was 4.39 hours and the overall mean time of children was 2.98 hours (see table 6 for the mean time of parents and children screen time). Both parent's and children's mean of screen time were gradually increased according to the increasing ages.

Age group	Mean of screen time (hour) (cor. to 2 d.p.)	S.D. (cor. to 2 d.p.)
3 years old		
Parents	3.75	2.01
Children	2.42	1.44
4 years old		
Parents	4.55	1.53
Children	2.86	1.13
5 years old		
Parents	4.57	2.19
Children	3.39	1.23
Overall		

Parents	4.39	1.92
Children	2.98	1.27

Table 6: Mean of parents and children screen time

Parental attitude on the impacts of digital devices

The degree of agreement on the positive impact on six aspects of child development was asked in the questionnaire. Parents chose their degree of agreement and the data were further transferred into number score in 1 to 4 point. The higher the score, the stronger the agreement on the positive impact. The highest mean score was benefiting reading skill (M=2.65), the lowest mean score was benefiting physical development (M=1.67). Generally, the mean score of overall development was 2.14, which indicated parents partly disagree with the positive impact by digital devices on overall child development (see table 7 for the mean of parents' attitude on the impact of digital devices).

'I agree that digital devices could benefit my child on…' (rated 1-4)		
Skill	Mean score (cor. to 2 d.p.)	S.D. (cor. to 2 d.p.)
Reading skill	2.65	0.72

Speaking skill	2.18	0.78
Social skill	2.02	0.69
Physical development	1.67	0.72
Attention span	2.23	0.87
Patience	2.09	0.83
Overall (in total 6 skills)	2.14	0.57

Table 7: Mean of parents' attitude on impact of digital devices

Parental attitude on rules of using digital devices

Frequency of adopting three rules when child was using digital devices was asked in this part. Parents selected the frequency from never to always. The data then transferred into 1 to 4 point, and finally sum up the total score to investigate their overall attitude on the restriction of using digital devices on children. The higher the score, the more the restriction when children were using digital devices. Table 8 showed there were slight differences among the mean of three rules. The mean score of 'time limitation' was the highest, at 3.44. The mean score of 'permission before use' was 3.39, while the mean score of 'co-using' was the lowest with 3.32. Overall, parents adopted the rules

often, with the mean score of 3.38 (see table 8 for the mean score of parents' attitudes on rules).

Question	Mean score (cor. to 2 d.p.)	S.D. (cor. to 2 d.p.)
I will limit my child's time spent on digital devices	3.44	0.57
My child needs to request my permission before using digital devices	3.39	0.67
I request my child to use digital devices with my company	3.32	0.71
Overall	3.38	0.55

Table 8: The mean score of parents' attitudes on rules

Relationship of child's screen time and parent's screen time

The result was generated through the SPSS application and three significant results showing the association. Table 9 presented the positive association between parent's average screen time and child's average screen time (β=.311, $p<.005$) (see table 9). In other words, the higher the parent's average screen time, the higher the child's average

screen time. The results showed there was a significant prediction on child's screen time by the length of parent's screen time.

Relationship of child's screen time and parent's attitude on the impact of digital devices

From table 9, there was a positive association between parent's attitudes on the impact of digital devices and child's screen time (β=.361, p<.005) (see table 9). It indicted when parents thought that using digital devices could help in children's development, children's time spent on digital devices would be longer. Again, parent's attitudes on the positive impact of digital devices could significantly predict his/her child's screen time.

Relationship of child's screen time and parent's attitude on rules on children using digital devices

Parent's rules on child's screen use were associated negatively with child's screen time (β=-.407, p<.005) (see table 9). It reflected the effectiveness of parent's rules, when there were more rules or frequent uses of rules, child's screen consumption would be lower. Meanwhile, child's screen time could be predicted by the parental attitude on the rules of children's screen use.

Relationship of child's screen time and SES

SES was the only variable that had no significant association with child's screen time (β=-.076, p>.005) (see table 9). Even though there was a negative standardized beta, the p-value was more than 0.005, it presented a non-significant association between two variables.

Child's average screen time	Standardized Coefficients Beta (β)	Sig.
Parent's average screen time	.311	.002
Parent's attitude on impact of digital devices	.361	.000
Parent's attitude on restriction on children using digital devices	-.407	.000
SES	-.076	.437

Table 9: Summary of associations between variables

Discussion

From table 6 about the statistic of children's current use of screen products, Hong Kong preschoolers overused digital devices much longer than the recommended time by AAP (2016) (2.98>1). It indicated the seriousness of Hong Kong preschoolers' screen

consumption and the awareness of parent education on young children's screen time. The factors behind might probably be explained by the associations of parental behaviors and attitude on using digital devices.

Parental behaviors on child's screen time

Parental behaviors are hypothesized to be positively associated with child's screen use, the result indicates the support of this hypothesis that if the parent spends more time on using digital devices, his/her child will be more likely to consume more on screen watching. The result is corresponded to the social learning theory by Bandura (1977) and research conclusions by Lauricella, Wartella and Rideout (2015). As mentioned in the literature, young children imitate people's behaviors by observing how they behave and think. Lauricella, Wartella and Rideout (2015) also supported the social learning theory on the effect of parental behaviors on 0 to 8 years old children. The result addresses the importance of parent modeling and parent's self-control. If the parent reduces time spent on digital devices and accompanies with child in other activities, child can transfer their attention from electronic devices to daily activities, and hence screen consumption can be eliminated efficiently. Therefore, self-discipline should be promoted to parents to enhance their awareness of parent modeling.

Parental attitude on child's screen use

It was hypothesized that positive attitudes on the impact of digital devices was positively associated with child's screen use, the result shows the consistent with the hypothesis. When the parent believes that digital devices can help in child development, they are more willing to allow child to engage in screen time, eventually results in the boost of child's screen consumption. The result is consistent with the previous researches that support the positive relationship (Cingel & Krcmar, 2013; Lauricella, Wartella & Rideout, 2015). The result draws attention to the parents' perception of how digital devices influence child's development. Lack of related information will possibly lead to the bias or misunderstanding on the impacts of digital devices. If there is sufficient information about both advantages and disadvantages of electronic devices, parents can evaluate comprehensively on child's screen consumption. Parents who are too restricted on child's screen use can have a fewer bias on the negative effect, and vice versa. Good balance on evaluating the child's screen time can be maintained through a comprehensive education about the influences of digital devices.

Another hypothesis about parental attitude on the rules is also significantly proved by the result. The result presents the negative association between child's screen time and the frequency of applying rules, the often the parent applies rules when child is using screen product, the shorter the child screen time. It is coherent to the studies that agreed on the negative association (Xu, Wen & Rissel, 2015; Downing, Hinkley & Hesketh,

2015). Reasonable time limitation can be effective on directly controlling child's screen utilization, more time can be allocated to some non-electronic activities, such as physical activity and playtime. Unstructured playtime can promote child's creativity. Moreover, the intimacy of parent-child relationship can be enhanced by eliminating the focus on electronic devices, parents can enjoy more conversation time spending with children. Asking permission before use is another straightforward way to inhibit child to use screen products and to avoid secretly use. Nevertheless, over-restriction may cause negative effects, for instance, if the parent always rejects child's request, the child may seldom ask for permission or even use devices behind parent's supervision, apparently it is not beneficial to parent-child relationship. Appropriate permission should be given to child with time limitations on using screen products. Lastly, co-using is not just as supervision in screen time, it also promotes social interaction and learning. Through co-engagement, parents can invite child to share his/her thoughts on using mobile phone applications or watching TV show, it provides chances for parents to understand what their children are doing. Parents can also share his/her thoughts and understanding on the related topic, teaching and guidance can be provided via co-using. Consequently, rules are not set to only monitoring children, but also promoting child-parent relationship.

Influence of SES to child's screen consumption

It was hypothesized that there was a negative relationship between SES and child's screen use, the result was not consistent with the hypothesis, as well as conflicting with the researches by Tandon et al. (2012) and Carson, Rosu and Janssen (2014). The reason may be the inapparent difference of participant's SES level. Table 5 showed the mean score of two SES levels, the cutting point of grouping was 12 but the mean score of the high-SES group was only 14.8 out of 23. It could only be regarded as 'relatively high' SES group rather than 'high' SES group. Therefore, the SES of two groups were too similar and it results in the unobvious difference between two groups.

Limitation

Small sampling group size

The sampling group is too small to represent the overall situation. There were only 57 participants in this study. Insufficient respondents may not be convincing and significant to conclude the association between parental factors and child's screen time and further apply to the overall Hong Kong children and parents.

Unexpected social circumstance

The questionnaire was distributed to parents in March 2020, At that time, due to the coronavirus, the Hong Kong government announced class suspension on all

kindergarten from January 2020. Children are not allowed to back to school. Daily lesson changes from face-to-face to online learning, teachers are required to videotape the lessons and put the video on the online platform, and parents play the video to children to learn. Assessments and exercises are done online. Hence, the opportunity of using screen products is vigorously increased for education purpose. Moreover, playgrounds and facilities for sports and entertainment, such as swimming pool and sports center, are closed during the time, children are not encouraged to go outside and involuntarily stay at home. Entertainment is limited at home and thus parents and children choose electronic devices as the most convenient entertainment tools. Regardless of the purpose of using digital devices, the social circumstance definitely boosts child's screen consumption. The reported time spent may not represent children's and parents' usual time spent.

Uneven distribution of participants

The original plan of the distribution of questionnaire was through different kindergarten. Because of the class suspension, the way of distribution changed to via online platform. Participants are difficult to control, and it may affect the SES proportion. The proportion of SES groups in recent study is uneven with the ratio of 6:4 and the SES variation within a group is also not boarded enough to see the obvious difference. For

instance, the mean score of the high-SES group was very close to the cutting point (14>12). Because of the uneven distribution, the result may be affected.

Unspecified purposes of using digital devices

Questions about the attitude on the impacts of digital devices do not include any classification of purposes in using screen products, parents are asked to answer by their general impression. In other words, they did not consider digital devices separately as a tool for entertainment or high-quality learning. Bias may be caused by general perception. If specific purposes are stated, bias may be eliminated and the results could be more accurate on the parental attitude towards digital devices.

Conclusion

This study filled the gaps of past studies in the aspects of the region, focused age group and inclusion of newer technologies. To conclude, the child's screen time was positively associated with parents' screen time and positive attitude on the impacts of digital devices. On the other hand, child's screen consumption was negatively associated with rules and had no association with SES. This study points out the importance of parent modeling and the promotion of education on using digital devices, further education should be provided by government or related organizations to publicize the appropriate use of screen products.

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Appendix 1: Survey sample

三至五歲香港兒童螢幕使用時間與家長因素的關係

參與同意書

現誠邀閣下參與由香港教育大學幼兒教育學系李敬廉教授監督，學生梁鈞虹執行的研究計劃。

研究簡介

是次研究內容是研究三至五歲香港兒童螢幕使用時間與家長因素之間的關係（例如社經地位、家長的螢幕使用時間、家庭體能活動時間及家長態度等）。研究參與者為擁有至少一名三至五歲於幼稚園在學的孩子之家長。

研究方法

每位參與者需完成一份問卷。問卷內容包括家庭背景（例如婚姻狀況、工作、教育程度及收入）、孩子及家長的螢幕使用時間（包括電腦、電視、智能電話及平版電腦）、家長對螢幕使用的態度及家庭體能活動時間。問卷回答大概需時 30 至 40 分鐘。

如何發佈研究結果

我們希望能得到閣下的同意讓我們分享研究成果，結果將以包括但不限於文本論文及口頭報告形式遞交相關人員。

閣下的參與純屬自願性質。閣下享有充分的權利在任何時候決定退出這項研究，更不會因此引致任何不良後果。凡有關閣下的資料將會保密，此研究將會以畢業論文形式呈交，一切資料的編碼只有研究人員得悉。

如閣下需要更多有關此研究的資訊，請以電話　　或電郵　　與梁鈞虹聯絡。

如閣下對這項研究的操守有任何意見,可隨時與香港教育大學人類實驗對象操守委員會聯絡(電郵:　　; 地址:香港教育大學研究與發展事務處)。

謝謝閣下有興趣參與這項研究。

梁鈞虹
首席研究員

請在適當空格填「✓」。

☐ 本人同意參與以上由李敬廉教授監督，學生梁鈞虹執行的研究計劃。

☐ 本人理解此研究所獲得的資料可用於未來的研究和學術發表，然而本人有權保護個人的隱私，其個人資料將不能洩漏。

☐ 研究者已將所附資料的有關步驟向本人作了充分的解釋。本人理解可能會出現的風險。本人是自願參與這項研究。

☐ 本人理解本人皆有權在研究過程中提出問題，並在任何時候決定退出研究，更不會因此而對研究工作產生的影響負有任何責任。

A) 個人及家庭資料部份

1. 你與孩子的關係是：
   ☐ 父親 ☐ 母親 ☐ 其他：_____

2. 你的孩子年齡是：☐ 3 ☐ 4 ☐ 5

3. 你的職業是：_____

4. 你的婚姻狀況是：
   ☐ 未婚 ☐ 已婚 ☐ 離婚 ☐ 其他：_____

5. 你的教育程度是：
   ☐ 小學或以下 ☐ 初中 ☐ 高中 ☐ 大專 ☐ 大學 ☐ 碩士或以上
   ☐ 其他：_____

6. 你的月收入狀況是：
   ☐ $ 10,000 或以下 ☐ $ 10,001 - $ 20,000 ☐ $ 20,001 - $ 40,000
   ☐ $ 40,001 - $ 60,000 ☐ $ 60,001 - $ 80,000 ☐ $ 80,001 - $ 100,000
   ☐ $ 100,001 - $ 120,000 ☐ $ 120,001 或以上

B) 你／孩子使用電子螢幕產品的情況

請綜合**你過往兩個星期**的情況作答。

你每天使用電子螢幕產品（包括手提電話、電腦、電視及平板電腦）的平均時間是：_____小時

請綜合**孩子過往兩個星期**的情況作答。

孩子每天使用電子螢幕產品（包括手提電話、電腦、電視及平板電腦）的平均時間是：_____小時

C) 你（家長）對電子螢幕產品的看法

我認為電子螢幕產品**有助**於我的孩子發展以下能力：

	十分不同意	部份不同意	部份同意	十分同意
1. 閱讀能力	1	2	3	4
2. 說話能力	1	2	3	4
3. 社交能力	1	2	3	4
4. 體能發展	1	2	3	4
5. 專注力	1	2	3	4
6. 耐性	1	2	3	4

請根據過往**兩個星期**的情況作答。

	從不	絕少	有時	經常
7. 我會限制孩子使用電子螢幕產品的時間。	1	2	3	4
8. 我會要求孩子得到我的允許才使用電子螢幕產品。	1	2	3	4
9. 我會協助孩子一同使用電子螢幕產品。	1	2	3	4