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**Relationship between
Hong Kong Children's Creativity and
their Television Viewing Habits**

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Abstract

Objectives. This study investigated the relationship between TV viewing habits of Hong Kong children and their creativity level. It also examined the effects of parental guidance in children's TV viewing behaviors and children's non-TV viewing activities.

Methods. A total of 98 primary school Grade 2 children participated in the study. A revised version of the Wallach-Kogan creativity tests was employed to measure participants' creativity level. In addition, the participants' parents completed a questionnaire to assess participants' TV viewing habits.

Results. Results showed that heavy TV viewers scored lower than moderate viewers on the verbal and figural scale of the creativity test. Heavy viewers of violent programs were less creative than their moderate viewer counterparts, whereas moderate viewers of non-violent adults programs were more creative than their heavy viewer counterparts. Moderate viewers with parental monitoring and moderation scored higher on the verbal creativity scale than their heavy viewer counterparts. Results of hierarchical linear regression analyses showed that father's education level and parental monitoring were positive predictors of children's creativity, whereas parental moderation was a negative predictor of children's creativity.

Discussion. The results demonstrate the importance of TV viewing habits on children's creativity level. Parents may improve children's creativity level, by limiting the time children spend on TV viewing to prevent displacement effect, and by stimulating children to choose programs that enhance, or at least do not interfere with, creativity.

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Relationship between Hong Kong Children's Creativity and their Television Viewing Habits

1.1. Background of the Study

How might television (TV) affect its viewers? Audiences may learn specific facts from TV programs. They may gain a general impression of reality, and acquire knowledge of other countries and people. They may also become more or less tolerant of behaviors observed on TV. Viewers may acquire certain types of information processing skills but TV viewing might limit their time with friends, and the family etc. Potential effects of TV can be grouped into two categories, namely, content effects and displacement effects (Williams, 1986 & Gauntlette, 1995). The former, content effects, include discussions of TV programs, what is shown, the techniques used for portrayal, and how different contents affect the viewers. Majority of studies in the past focused on negative, unintended effects of TV violence on viewers', especially children and adolescents' aggressive behavior. Recently, more researchers have been focusing on the positive effects of TV viewing, such as on social behaviors, and creative and imaginative thinking. The latter, displacement effects, attracted a variety of concerns when TV was a new thing, such as investigation about whether children sleep later, spend less time on homework, read fewer or different materials etc.

Thus we could ask how and where does TV viewing fit into children's life? Does TV viewing have a positive or negative effect on the development of a child in general, and its creative thinking in particular? It might be argued that TV represents an important, easily

accessible alternative to parental storytelling and spontaneous play. Especially for those children whose parents are overworked, inaccessible or lack the cultural orientation or skills, TV seems a good and cheap way to offer the opportunity for them to come into contact with magic, fantasy and richer information about the world. TV watching, as a stimulus situation, has special qualities that require careful examination (Singer & Singer, 1981b).

The evidence for negative effects of TV on different aspects of behaviors, including creativity of children appears to be stronger than for positive effects (Singer & Singer 2001). However, with mediation by parents or other significant adults, children may be helped to process TV programs more effectively or even benefit from it (Anuradha, 1994). Study conducted in Hong Kong (MDR Technology, 1994) revealed that 57% of the married couples with children aged 3 to 12 often accompany their children to watch TV in the evening or at night (mostly between seven to ten o'clock). However, in Hong Kong, the mediation effect by the adults is yet to be found.

So far in Hong Kong, studies on mass media have been focusing on the effect of the transition to Chinese rule on press issues, self-censorship, and press freedom, profiles of journalists, sexism and stereotyping in the media (Goonasekera & Holaday, 1998). The only study that can be found about TV viewing habit was compiled by "The Union" with Lawrence Shamrock, Lui Yue Shing, and Philip Yu as the team members (quoted in their website, 1999). Its aim was to find out whether residual (channel loyalty) TV rating exists in

Hong Kong. No formal research has been carried out on the relationship between TV viewing and children's development.

The purpose of the present study is to investigate the relationship between Hong Kong children's TV viewing habits and their creativity. In 1994, Hong Kong people on average spent 3.6 hours per day on watching TV (MDR Technology, 1994). Given the time Hong Kong children spend every day at home besides going to school, they definitely will spend a longer time on TV viewing than the adults. Also, as quoted in the report in 1985 by the Hong Kong Broadcasting Review Board, TV viewing might have important influence on children in Hong Kong due to a number of facts. Over 95% of families in Hong Kong own at least one TV set at home. Watching TV is the major leisure activity of Hong Kong children. More mothers goes out to work, thus leaving their children at home before and after school, who watch TV alone with no adult guidance in TV programs selection. Because of the potential impact of TV viewing on children's development, the present study may provide some theoretical benefits such as contributing to our knowledge regarding TV viewing pattern among Hong Kong kids. It may also serve as a useful reference for parents, educators and psychologists concerned with child development as it may provide preliminary data on a possible link between TV and creativity. This study also seeks to relate frequency, program content, and other characteristics of home viewing by children to various patterns of creativity. The research questions to be investigated are as follows:

1. Would heavy TV viewers tend to score lower or higher on creativity tests?
2. Does watching specific TV programs frequently or rating specific programs as most favorite relate to scores on creativity tests?
3. Does adult mediation in TV viewing at home have an impact on the patterns found in research questions 1 and 2 above?

In this research report, there will be five chapters, namely, introduction, literature review, method, results, and discussions. The first chapter, Introduction, outlines the background of the study. The second one reviews studies previously conducted in relation to creativity and TV viewing. The third chapter, Method, provides operational definitions of variables investigated in the study, participants' details, instruments and procedures of the study. The fourth chapter presents findings of the study. The last chapter discusses implications of the results, future directions and limitations of the study.

Literature Review

2.1. Conceptualization of Creativity

2.1.1. Definitions

In the 1950's address to the American Psychological Association, Guilford defined creativity in terms of the *person*. He referred to "the abilities that are most characteristic of creative people" (p.444), or the creative personality. His concept of "patterns of traits" (p.444) of creative persons is still popular in most of the studies in recent years (Amabile, 1996).

Later in 1959, Guilford further conceptualized creativity in terms of the mental abilities involved in creative achievement. He saw creative thinking as involving divergent production, which was defined as the generation of new information from given information with emphasis on the variety of output.

Torrance (1995) selected the process aspect as his point of focus, and defined creativity as "taking place in the process of sensing difficulties, problems, gaps in information, or missing elements; making guesses or formulating hypotheses about these deficiencies; testing these guesses and possibly revising and retesting them; and finally communicating the results" (p.72).

Amabile (1996) proposed both the conceptual and operational definitions. Her studies are grounded in a conceptual definition of creativity - an explicitly operational definition that implicitly underlies most subjective assessment methodologies. She proposed that creativity can be defined as "the quality of products or responses judged to be creative by appropriate observers" (p.33), or the process by which something so judged is produced. Her conceptual definition comprises two essential elements - "it is both a novel and appropriate, useful, correct or valuable response to the task at hand, and the task is heuristic rather than algorithmic" (p.35).

It may be difficult to have a universal definition of creativity. As summarized by Torrance (1995) and Baer (1993), creativity involves a number of different aspects. In most

operational definitions, the production of something new is included, such as that proposed by Thurstone and Stewart (as quoted in Torrance, 1995), who maintained that an act was creative even if the idea might have already been produced by someone else before, as long as the thinker reached the solution in a sudden thought and was novel to him. On the contrary, Stein (1953, as quoted in Torrance, 1995) insisted that the definition must involve the culture, i.e. the society must regard it as novel idea. A few researchers such as Crutchfield (as quoted in Cropley, 1968) also defined creativity as contrast to conformity. The former being contribution of original ideas, different point of view, and new ways of looking at problems, while the latter as doing something expected. And Taylor (1959) suggested that there should be five levels of creativity, namely, expressive, productive, inventive, innovative, and emergentive creativity.

2.1.2. Theories and Approaches

2.1.2.1. Seven approaches categorized by Sternberg

Sternberg (1999) classified approaches to the study of creativity into seven different groups. In the first, the mystical approach, creativity is associated with mystical beliefs, which make it hard to lend itself to scientific study as it is a spiritual process. This approach was taken over by the pragmatic approach. One of the foremost proponents of this approach was Edward De Bono, who was concerned more with developing and understanding creativity, than with testing the validity of the ideas. The third approach is psychodynamic in

nature, supported by Freud (1959) and Kubie (1958) (as quoted in Sternberg, 1999). This approach based on the idea that creativity arises from the tension between conscious reality and unconscious drives. Freud proposed that creative work was a way to express unconscious wishes in a publicly accepted manner, while Kubie claimed that unconscious conflicts might actually have negative effect on creativity as they lead to fixated and repetitive thoughts.

The fourth one, the psychometric approach, was proposed by Guilford and supported by Torrance, who claimed that creativity could be studied in everyday situations, using paper-and-pencil tests. The latter developed the Torrance Tests of Creative Thinking to measure such characteristics of creative thinking as fluency, flexibility, originality and elaboration.

The cognitive approach to the study of creativity aim at investigating the mental representations and processes underlying creative thought. Weisberg proposed in 1993 (as quoted in Sternberg, 1999) that creativity involved ordinary cognitive processes producing extraordinary products.

Investigators such as Amabile (1983) and Eysenck (1993) (as quoted in Sternberg, 1999) favored social-personality approaches and focused on personality variables, motivational variables, and sociocultural environment as sources for creativity. They also noted that certain personality traits often characterized creative people. The seventh approach, according to Sternberg (1999), is represented by the confluence theories of creativity, which offer the possibility of accounting for diverse aspects or multiple components of creativity.

First, there might be a threshold for some components below which creativity is not possible. Second, partial compensation may occur, i.e. strength on one may counteract weakness on the other component. Third, there may be interaction between components, and high levels on both could multiplicatively enhance creativity.

2.1.2.2. The Four Ps of Creativity

By refining Rhodes' ideas (1961), Mooney (1975) proposed that there were four approaches (viz the so-called "Four Ps") to creativity, namely, the nature and quality of the *product* created; the actual expression of the creative acts and the continuing *process* of and during the creation; the nature or *person* of the individual creator; and the environmental factors (the *press*) in which creation comes about or that tend to initiate and foster creativity.

Welsh (1975) also suggested a modification and translated the concepts into common terms - "who are the creative persons; what is it that they do that can be called creative; how do they do it; why do they do what they do; where do they show their creativity" (p.6).

Welsh (1975) also summarized the 4 Ps as follows - The creative person appears to have certain personality characteristics that can be delineated, such as openness to stimuli, flexibility, independence in attitude and social behavior, wide interests, intuitiveness etc. However, to be sure, we sometimes make judgments about someone based on what he or she has produced to decide his or her worth or value as an individual. This may be particularly true for creative persons. For the process aspect, Wallas (1926, as quoted in Welsh, 1975)

argued that it consisted of four identifiable stages, namely, preparation, incubation, illumination and verification. And Harris (1959, as quoted in Welsh, 1975) suggested six steps - realizing the need, gathering information, thinking through, imagining solutions, verification, and putting ideas into work. The term "press" was first introduced as psychological concept by Murray (1938, as quoted in Welsh, 1975) to indicate pressure and influence that objects or persons in the environment have on an individual.

2.1.2.3. Interactionist Approaches

From an interactionist perspective, the behavior of an organism at any point in time is a complex interaction of the situation, and the nature and behavioral potentiality of the organism itself. The model incorporates important elements of the personality, cognitive and social psychology explanations of creativity, and thus helps to improve ability to understand creative persons, processes, and products (Glover, Ronning, & Reynolds, 1989). The major categories of variables delineated by the interactionist model are antecedent conditions, cognitive style/abilities, personality, contextual and social influences. These provide a framework to examine some of the specific factors that account for or explain differences in creative behavior or the capability to produce creative products.

Among the categories of variables, contextual and social influences may be the most relevant elements for the present study, as they contain such things as physical environment, culture, group climate, role models (viz may include characters in television programs) etc.

Torrance (as quoted in Glover, Ronning, & Reynolds, 1989) also suggested that "factors in nature and society" (viz social and contextual factors) (p.86) affect development and/or expression of creative thinking in children. These environmental factors include "the teaching of principles for thinking up ideas" (p.86). They are also those factors that have potential to foster creativity, giving the individual with potential to be creative the chance to develop the necessary skills. In addition, Amabile asserted that improved creative performance is due to the exposure to the appropriate models (Glover, Ronning, & Reynolds, 1989), which may also be fulfilled by some kinds of television viewing.

Csikszentmihalyi's system perspective (as quoted in Rudowicz & Hui, 1998) also implied that creativity is affected by human action, and the cultural and social factors. In Hong Kong, Rudowicz and Hui (1998) adopted a similar system approach to investigate into Hong Kong Chinese people's views on creativity. According to them, creativity was said to be influenced by interaction among the same three main factors. In other words, creativity was assessed within its social, historical and cultural contexts.

2.2. Television and Viewing

Singer and Singer (1981 a) claimed that children who were about three to four years old represented the beginning of TV viewing. It was the age group when TV viewing habits started to emerge or form in children (Singer & Singer, 1981a). But how exactly do people, especially children, distribute their time on TV watching? In Hong

Kong, a survey done in 1993/1994 (MDR Technology, 1994) indicated that the most frequent watched TV programs by Hong Kong people were news (74%), drama (68%) and movies (36%), followed by current affairs (31%), informative (18%) and musical (18%) programs. Although there has been no survey done in Hong Kong with children as target participants, it may be estimated that besides watching programs for children (at least 2.5 hours per day, as quoted in Symposium on Broadcasting Industry of HK in the 90's, 1989) which are shown in the morning and the afternoon, there is a similar pattern in the evening and at night when children in Hong Kong accompany their parents and family to watch TV

Singer & Singer (1981b) identified six special properties of the TV medium. The first one, "attention demand" implies that TV programs, especially those quick-cut like Sesame Street, can keep children concentrating on the screen consistently. The activity in the screen is continuous but not rhythmic, and thus TV evokes an orienting response from the human brain, a basically adaptive mechanism. The second one, "brief sequences" means due to the fear of loss of audience attention, commercial TV has evolved a style of extremely brief sequences of events. An interaction or a depiction sequence seldom runs more than a few minutes without a sharp change of scene or characters.

The third one, "interference effects" are related to alteration in our memory systems due to the rapid and complete changes of material on TV. For children, this may not only interfere with immediate recall or comprehension but also impede the development of the

private rehearsal system. The fourth one, "complexity of television presentations" – the complex vocabulary, rapidity and variety may sharpen children's quickness to grasp material, adjust to complexity and get the benefit, especially for the more intelligent children.

The fifth one, "the visual orientation" implies that as TV has done a great deal of 'work' for us, we do not have to perform such a complex transformations as for the radio or printed media. And the sixth one, "emphasis on action and violence" indicates TV producers also believe that TV cannot hold viewers' attention without vigorous movements or acts of aggression. One of the consequences may be imitation from children in daily life, including adopting characters as identification figures and expression during playtime.

Why has TV viewing become a concern of empirical researches? Children are growing up today in an environment that includes an element of daily visual stimulation never observed before in the human history. TV is there in the home all the time, accompanying children. Because of the amount of time during which most children are exposed to pictorially presented models, mainly through TV, such models play a major part in shaping behaviors (Bandura & Walters, 1963). The special role of TV viewing then cannot be ignored. We may examine its effect through investigation of children's TV viewing habits (Bandura & Walters, 1963; Tower, Singer, Singer, & Biggs, 1979).

As summarized by Anuradha (1994), Barwise and Ehrenberg (1992), Condry (1989), and Singer and Singer (1981b), the TV viewing logs to investigate TV viewing habits and

their effects may comprise of the amount of time children spend on TV viewing each day, the intensity or concentration in a program, whether the children watch alone or with specific others (i.e. monitoring and mediation from adults), specific programs viewed, favorite programs, how much they like what they watch, when and why they watch etc.

2.3. Relationship between Television Viewing Habits and Creativity

As reviewed by Valkenburg (Singer & Singer, 2001), most publications on TV's influence on creativity and imagination used closely related concepts, such as fantasy, daydreaming, imaginative play, creative imagination, and creativity. Maybe it would be better to ignore the terms and definitions used in these studies and concentrate on how creativity is operationalized. Valkenburg found out that there are basically three imaginable processes in use, namely, imaginative play (sometimes called fantasy play or pretend play), creativity (or creative imagination) and daydreaming (or fantasizing). According to Valkenburg, the first one is in use usually when relating to cognitive and social development of children. The second one often demands the aspect of communication and the "overtly observable" element. The third one frequently involves inner, private activity. And as Van Der Voort and Valkenburg (1994) mentioned, there were indications that a high level of fantasy play in childhood promoted creativity in the long run.

To many researchers, creativity or daydreaming seems to start around the age of five or six (Singer & Singer, 2001). This is also an age of initiation into the world of TV watching

(Singer & Singer, 1981a). Some researchers like Piaget believed that younger children could not be creative as they could not discriminate between outer stimuli and inner experience of it. They, therefore, could not recognize dreams were products of thoughts. In the present study, our target group is also chosen based on these rationales.

Many concerns about TV's impacts apply particularly to children's viewing. It is felt that children may be more likely than adults to be affected by program content. Whether the long-term effects of TV do more harm than good is debatable. The balance of researchers' opinion is that children learn little from unlimited, unselective, unsupervised viewing, but can have their lives enriched by limited, selective, partly supervised viewing (Barwise & Ehrenberg, 1992).

The social learning analysis of observational learning proposed by Bandura assumed that modeling influences operate principally through their informative function, and that observers acquire mainly symbolic representation of modeled events rather than specific stimulus-response associations (Parke, 1972 & Bandura, 2002).

Bandura (1977, 1986, & 2002) claimed that creativity and innovation can emerge through the modeling process. Modeling can contribute to creative development in several ways. It can provide the cognitive and behavioral tools for innovative ideas as the requisite knowledge and skills can be learnt by example and practice. Creative learners continue to learn things from others that might add new dimensions to their own creative work. The

social-cognitive approach regards children as active viewers rather than merely passive receivers of TV. In making sense of the TV, children are engaged in a complex process of interpreting, selecting, processing and evaluating new information (Buckingham, 1987).

One who claims that modeling may hinder creative thinking may say that established ways of thinking impede exploration of new ideas and perception of new relationships, such as that demonstrated by TV viewing. As long as familiar models are adequate, there is little incentive to consider alternatives. However, modeling influences, according to Bandura (1986), that exemplify new perspectives on common situations can foster creative performance by weakening conventional inclinations. If some children are exposed to TV characters or models who think divergently, they will usually be more innovative, as creative ideas are enhanced, than those exposed to models who behave in conventional ways (Rosenthal & Zimmerman, 1978).

2.3.1. Hypotheses explaining effect of TV viewing on creativity

Researchers have contradictory opinions about influence of TV viewing on creativity (Singer & Singer, 2001). Some believe that TV programs encourage play and promote creativity. This was referred to as *Stimulation Hypothesis* by Valkenburg (as quoted in Singer & Singer, 2001). And many others argue that TV programs hinder creativity. Valkenburg positioned it as the *Reduction Hypotheses*.

According to the *Stimulation Hypothesis* (Singer & Singer, 2001), TV has positive impact on children's creativity, creative tasks or imaginative play by enriching the store of ideas from which children can generate when engage in these acts. It is argued that TV characters and events will be picked up, transformed and incorporated into children's creative products. Then as a result the quality or quantity of their creative products may be improved.

The results of the correlational study conducted by Schmitt et al. (1997, quoted in Singer & Singer, 2001) suggested that viewing educational TV programs in particular might result in higher level of children's creativity overtime. Schmitt's conclusions, however, did not receive support from Berry & Asamen (1993), who reviewed the environmental contexts which promote creativity and found that the TV was usually excluded as a medium promoting creativity. Singer & Singer (1981b) asserts that most researchers think that creativity will be best stimulated by a teacher urging students to follow up on their original ideas, or through mother-children interactions, usually in the form of storytelling. TV programs can play a role if it can be interactive. Unfortunately, most of the programs on show are for entertaining viewers, not educating children.

Valkenburg classified the *Reduction Hypotheses* into six distinctive groups, namely, the *Displacement Hypothesis*, *Passivity Hypothesis*, *Rapid-Pacing Hypothesis*, *Visualization Hypothesis*, *Arousal Hypothesis* and *Anxiety Hypothesis*. The last two

hypotheses are particularly related to the effects of TV violence on creativity and imagination of children audiences.

Howe (1983) who made reference to the *Displacement Hypothesis* put forward the idea that children's creativity is reduced when children spend plenty of their time on watching TV, at the expense of other leisure activities, such as playing, reading and listening to the radio. In this case, TV's reductive effect is not due to TV itself, but to the fact that it replaces other more beneficial activities.

Two studies, namely, Maccoby's (1951) and Schramm et al.'s (1961) (as quoted in Singer & Singer, 2001), showed that watching TV occurred at the expense of playtime in general. There is also evidence showing that introduction of TV leads to reduction of time spent on other media such as cinema, comic books and radio. But it is not yet sure whether this displacement will lead to reduced creativity.

Adherents of the *Passivity Hypothesis* view TV as "an easy medium", as it requires from audience little mental effort to understand the messages, especially in comparison with other media. Thus, children may consume fewer fantasies produced by others and their willingness to use their own imagination in making creative products is undermined. However, there is no empirical evidence directly testing and supporting this hypothesis.

The *Rapid-Pacing Hypothesis* states that TV program's rapid pace will reduce children's creativity. It is argued that children are forced to process images and messages, that

are given in rapid succession, immediately after viewing. Thus little time is allowed for children to process the information at their own pace or have any special reflections on the program content or messages.

According to the *Visualization Hypothesis*, the reductive effect of TV viewing is attributed to its visual nature as compared to other media. Messages are presented to viewers with ready-made visual images, and hence children audiences have little room to create their own images. When engaging in creative activities, they then have difficulty in generating new ideas as they are so used to images supplied by the TV programs.

The *Arousal Hypothesis* assumes that action-oriented, violent or aggressive TV programs such as 'The Mighty Morphin Power Rangers' will lead to hyperactivity due to their arousing nature (Macbeth, 1996). Children's physically active and impulsive behavior and orientation is thought of as disturbance to their sequential thoughts and planning abilities necessary for creative play and acts.

In accordance with the *Anxiety Hypothesis*, it is argued that violent TV programs, such as 'The Exorcist', may also generate fright reactions in children viewers (Macbeth, 1996). It may then lead to regression in behavior. High levels of anxiety may disrupt fantasy play and creativity.

2.3.2. Research Findings on TV and its related impacts on creativity

Interest in investigations of the influence of TV on creative and imaginative skills, and children's play developed in the late 1970's (Friedrich-Cofer, Huston-Stein, Kipnis, Susman, & Clewett, 1979; Singer & Singer, 1976; Singer & Singer, 1981a & b; Tower, Singer, Singer, & Biggs, 1979). These studies found out that specific types of programs such as child-oriented commercial shows or non-violent adult dramas might have a positive effect on creativity, especially if the viewing was moderated and mediated by an adult. However, heavy viewers also tended to be less imaginative.

A number of other researchers investigated the impact of different forms of media on creativity (Meline, 1976; Rubenstein, 2000; Runco & Pezdek, 1984). Meline (1976) compared the effects of film, print and audiotape on children's creative problem solving ability and found out that the "print groups" significantly outperformed the "video groups" in the ability. This implies that the medium in which problem information was presented to children did *affect* the way they used their creative thought processes in problem solving. In Rubenstein's experimental study (2000), it was discovered that content has more effect on creativity and attitude than media. Runco and Pezdek (1984) found no differences between radio and TV as stimuli for creative ideas. They claimed that it was because the exposure to the media during the experiment was only short-term.

In a rare kind of experiment, Williams (1986) was able to examine the effects of TV viewing on the creativity of grades 4, 6, 7, and 9 children and a group of adults. Williams

compared three communities in Canada, labeled as, Notel (a town by then has few regular TV viewers), Unitel (having one TV channel), and Multitel (having several channels). In the study, the Alternative Uses (Guilford's (1975)) and Pattern Meaning (Wallach & Kogan's (1965)) creativity tasks were used for the children to measure their divergent thinking and ideational fluency, respectively. In both the cross-sectional and longitudinal samples, creativity scores on the Alternative Uses task were negatively affected by TV viewing, by comparing the scores before and two years after TV was introduced in Notel (Macbeth, 1996).

In most Asian countries children under the age of 15 comprise around 40 per cent of the population. The proportion being even higher in poor countries like India. And due to the one-child policy and overworking trend among parents, children in China have heavy daily engagement with the small screen, which even becomes the `fourth audio-visual member` of the family (Zhao, 1996). However, only a small proportion of TV programs in Asia are made for children (Carlsson & von Feilitzen, 1998; Valbuena, 1991). In the case of Hong Kong, children aged 14 and below comprise 19% of the population. There are four free TV channels offered for viewing. Focusing on the two channels of Television Broadcasts Ltd., namely, Jade and Pearl, which earn higher TV ratings from Hong Kong people, only around 11 hours per week (6.8%) of the local-made programs in each of the two channels are made for children, and a total of 35.3 hours per week (around 12%) of imported programs in both channels are for children. In addition, around 26% of the local programs for both channels are

informational or educational, which may or may not be suitable for children (Goonasekera & Holaday, 1998). Implications of these figures on creativity of children in Hong Kong are yet to be discovered.

In Japan, Furu (as quoted in Macbeth, 1996) reported in 1971 that heavy TV viewers, by comparison with print-oriented children, were inferior in "intelligence, creativity, positivity, and adaptability, and had less interest in 'thinking' and 'science'".

In India, Anuradha (1994) had interviewed 180 children aged 5 to 10 and their parents to investigate various aspects of TV viewing behaviors and attitudes of children. Firstly, it was found out that more than 50 per cent of the parents felt that TV has affected their children's playing and reading time. This might be in line with the prediction of the *Displacement Hypothesis* discussed above. Secondly, both boys and girls mentioned that children's programs are their favorite programs. Next to this, boys preferred comedy serials and girls preferred films and songs. Thirdly, excessive TV viewing seemed to have a definite negative effect on educational development of children. However, the author said that it should be noted that TV viewing all had also positive contributions to the cognitive growth and development of children provided that it was properly monitored by parents.

In Taiwan, Chen (1969) investigated, mainly in the form of questionnaires, the impact of local children TV programs on kids. It was found out that TV viewing could

provide children with more knowledge and "common sense" about the world. The common experience obtained may stimulate play and promote creative thinking. These observations lend support to the *Stimulation Hypothesis* mentioned in the earlier section. In addition, Chen claimed that provided that TV viewing is not excessive, children's cognition and thinking ability will not be adversely affected. On the contrary, with stimulation from TV, children's brain can be trained.

In Thailand, Udornpim and Singhal (1999) assessed the effects of a highly popular Japanese soap opera, *Oshin*, by drawing upon the social learning theory to investigate role-modeling effects of TV viewing. One of the pro-social values learnt from the program by the Thai viewers was being creative, imaginative, humorous and thoughtful, though the authors could not prove whether the viewers actually put into practice any of the values.

2.4. Problems and Hypotheses of the Study

There are two types of research problems in the present study, namely, exploratory and explanatory problems.

Exploratory Problems

Exploratory research problems aim at finding out about TV watching habits among Hong Kong children. These problems are grouped into the following categories:

TV Watching Preferences

1. How much time does the child spend on watching TV each week?
2. When does the child usually watch TV?
3. What is/are the child's favorite and most frequently watched program(s)?
4. Does the child concentrate on the programs (or does he/she do other things simultaneously)?
5. Why does the child watch TV?
6. Who decides about the program watched by the child?

Parental Guidance in TV Watching

7. Are parents or other adults at home when the child is watching TV?
8. Do parents watch TV together with the child and how often?
9. Which are the shows the child regularly watches alone, and which are watched together with family members?
10. Which family member(s) usually watch(es) TV together with the child?
11. Which family member(s) usually select(s) programs to be watched together?
12. Do parents discuss with the child about the programs before and after watching?
13. Does the child have any fright reactions after watching TV? Any frequent nightmares?

Other Home Activities

14. Do adults at home tell stories to the child regularly?
15. Do adults at home read stories to the child regularly?

16. Is the child physically active? If yes, what are the most common child's activities?

17. How much time does the child spend on other leisure activities per week?

Explanatory Problems

Explanatory research problems aim at finding out the correlation between various aspects of TV viewing habits and the child's creativity among Hong Kong children.

1. Is there any correlation between time spent on TV viewing and creativity?
2. Is there any correlation between the type of TV programs viewed, such as
 - (a) violent shows;
 - (b) educational/children's programs; or
 - (c) non-violent adult shows,
 and the child's creativity?
3. Is the correlation between types of programs watched and the child's creativity affected by the amount of time spent on watching the given type of program?
4. Is there any correlation between TV viewing with parental
 - (a) monitoring in selection of programs; or
 - (b) mediation/moderation
 and the child's creativity?
5. Is the correlation between parental guidance in TV viewing and the child's creativity affected by the amount of time spent on TV watching?

Hypotheses

1. Heavy viewers are less creative, in terms of their creativity tests scores, both verbal and figural.
2. There is a negative correlation between viewing violent shows and the child's creativity, in terms of their creativity tests scores, both verbal and figural.
3. Within the group of children who frequently view violent programs, the length of time in viewing these programs will have a negative effect on the child's creativity, in terms of their creativity tests scores, both verbal and figural.
4. There is a positive correlation between viewing
 - 4.1 educational/children programs; or
 - 4.2 non-violent adult shows
 and the child's creativity, in terms of their creativity tests scores, both verbal and figural.
5. Moderate viewers of
 - 5.1 educational/children programs; or
 - 5.2 non-violent adult shows
 will have higher creativity tests scores, both verbal and figural, than heavy viewers.
6. There is a positive correlation between TV viewing with parental
 - 6.1 monitoring in selection of programs; or
 - 6.2 mediation / moderation

and the child's creativity, in terms of their creativity tests scores, both verbal and figural.

7. Moderate viewers with parental

7.1 monitoring in selection of programs; or

7.2 mediation / moderation

will have higher creativity tests scores, both verbal and figural, than heavy viewers.

Method

This chapter will first introduce the operational definitions of the variables, namely, creativity, TV viewing habits, parental guidance in TV watching, and other activities of the children. Then the participants, the instruments and the procedure for the study will be described.

3.1 Operational Definitions of Variables

The independent variable in this study is Hong Kong children's TV viewing habits and the dependent variable is their creativity. The potential variables, which may exert moderating effect on the relationship between the independent and dependent variables, are parental guidance in TV watching and other activities of the children. As this study is an Ex Post Facto Design, the researcher could not manipulate the conditions. Thus, the research was designed to examine the correlations among the independent and dependent variables. The followings are the operational definitions of the study.

3.1.1. Creativity

This study concentrated on divergent thinking as an index of creative potential (Wallach & Kogan, 1965). In the present research, three variables, fluency, flexibility and originality of ideas, were measured as indicators of divergent thinking. Fluency was operationalized as the number of ideas or solutions proposed to a problem presented in the test. Flexibility was described as the number of shifts in thinking or different categories of response (Torrance, 1995). Thus, the less single ideas or solution might become classified under one category, the higher was the degree of flexibility. The originality of an idea was dependent on its remoteness or statistical rarity. It was defined by Wallach and Kogan as any response to a given item which was offered by only one out of 151 sample children, by doing a frequency distribution analysis. Responses to the test situation in the present study which were produced by less than 5% of total number of participants scored a point for originality.

3.1.2. TV Viewing Habits

The total time children spent watching TV and the types of programs children watched most or favored most were examined. According to the categorization method by Singer and Singer (1981), TV programs might be classified into nine categories, namely, cartoons, children's shows (commercial TV), child-oriented shows (educational TV or public TV), family comedy, variety/game shows, adult-family shows, action/adventure or detective,

and potentially violent or suspenseful shows, sports, and newscasts and documentaries. The intensity or the attention children paid to TV viewing was also investigated. Children who concentrated completely on the TV programs were considered as "high intensity" viewers, whereas children who were doing other things simultaneously were classified as "low intensity" viewers.

3.1.3. Parental Guidance in TV Watching

It was predicted that the relationship between TV watching and the level of creativity would be moderated by parental guidance. Thus the aspects of parental monitoring, selection and moderation of TV programs were examined in the TV viewing habits survey. For 'monitoring', questions like whether parents or other adults were at home when the children were watching TV, how often the adults watched TV together with the children, the shows children watched alone and together with other adults, were asked. For 'selection', questions about who decided about the TV programs the children watched alone and together with other family members, were asked. For 'moderation', questions about whether parents discussed with their children about the programs before and after watching were asked.

3.1.4. Other Activities of Children

Other leisure activities children engaged in at home and after school might compete with TV watching in occupying children's time and effort. These activities might also be a potential moderator in the relationship between TV viewing and creativity. Thus, information

about other extracurricular activities of the children was also obtained. Parents' responses to questions about the children's most common activities, the time they spent on these activities each week, the storytelling and story reading habits, and other activities that parents did with the children provided this information.

3.2. Participants

Ninety-eight primary school students (55 boys and 43 girls) of Grades 2 and their parents from two primary schools in Hong Kong participated in the study. One school is located in Wanchai and the other is at Shau Kei Wan. These two schools represented a convenience sample. However, two Grade 2 classes were randomly selected from each school. These classes are all average in terms of students' academic abilities. The size of the classes ranged from 23-25 students. Both schools are co-educational, and all students (and their parents) participating in the study are Chinese. The schools use mainly Chinese as a language of instruction and implement traditional teaching method. The criterion for selection of children was based on the positive response from the parents to the letter from the teachers requesting their permission for their child to participate in the study and their cooperation in filling in a questionnaire regarding the family's TV viewing habits. The sample consisted of children between the ages of six and nine. The mean age and the mode for the entire sample were 7.42 ($SD=0.72$) and 7 respectively. The mean age for girls was 7.44 ($SD=0.63$) and that for boys was 7.40 ($SD=0.78$). The modes for genders were both 7.

Table 1. Demographic Data of the Sample Children

<u>Particulars</u>	<u>Number</u>	<u>Percentage</u>
Gender: Male	55	56.1
Female	43	43.9
Age: 6	6	6.1
7	52	53.1
8	33	33.7
9	7	7.1

Table 2. Demographic Data of Sample Parents

<u>Particulars</u>	<u>Mother</u>		<u>Father</u>	
	<u>Number</u>	<u>Percentage</u>	<u>Number</u>	<u>Percentage</u>
Educational Level:				
No education/below primary	4	4.1	1	1
Completed primary school ed.	13	13.3	12	12.2
Completed secondary school ed.	68	69.4	65	66.3
University education and above	13	13.3	20	20.4
Occupation:				
Clerical	28	28.6	15	15.3
Sales/Promotion/Marketing	19	19.4	17	17.3
Information Technology	2	2.0	4	4.1
Management	4	4.1	13	13.3
Education	9	9.2	7	7.1
Social Service	5	5.1	5	5.1
Manufacturing	3	3.1	8	8.2
Legal	2	2.0	4	4.1
Medical	2	2.0	6	6.1
Business	5	5.1	9	9.2
Workmen	18	18.4	9	9.2
Missing	1	1.0	1	1.0
Total	98	100.0	98	100.0

According to the information given by the schools, the distribution of the education

level of the mothers was as follow: 4.1% ($n=4$) was under the category `no education or

below primary school education', 13.3% ($n=13$) completed primary school education, 69.4% ($n=68$) completed secondary school education, and 13.3% ($n=13$) completed university education (or equivalent) and above. For the fathers, the distribution was 1 ($n=1$), 12.2% ($n=12$), 66.3% ($n=65$), and 20.4% ($n=20$) respectively (Tables 1 and 2).

3.3. Instruments

3.3.1 Creativity Tests

The present study adopted the modified version (Chan et al., 2001) of the Wallach and Kogan's creativity test (1965). All items and instructions were translated from English into Chinese and back-translated from Chinese into English to ensure that the meanings of the English and Chinese versions were as close as possible. The method used for assessing creativity was a battery of five tests, namely, "instances", "alternative uses", "similarities", "pattern meanings", and "line meanings". The first three tests are based on verbal stimuli and the latter two involve visual stimulus materials. Each of the five tests consists of two items. According to Chan et al. (2001), completion of the ten items requires around 70 minutes. As in Wallach & Kogan's study (1965), two scores are derived from each test item, namely the total number of responses (*fluency*) and the number of responses that were statistically unique (*originality*). One more score, the total number of *categories* of responses (*flexibility*), was added in this study to capture an additional dimension in divergent thinking abilities,

which was lacking in both Chan et al. (2001) and Wallach and Kogan's studies (1965). A total creativity index is a sum of these scores from ten test items

In the first test, "instances", the child is asked to generate possible instances of a class concept such as to name all the square things he or she can think of. In the second technique, "alternative uses", the child is asked to generate possible uses for an object, such as all the different uses he or she can think of a knife. For the third verbal test, "similarities", the child is to generate possible similarities between two objects, such as potato and carrot. The fourth one, which is a figural test, "pattern meanings", is for generating meanings or interpretations for each of the abstract visual designs. The fifth test, also a non-verbal test, "line meanings", asks the child to observe lines and to generate meanings or interpretations relevant to the form of line in question (Wallach & Kogan, 1965).

In order to establish the degree of interrelationship among the creativity measures, Wallach and Kogan (1965) evaluated the reliability of the tests by several approaches. Matrices of intercorrelations among the creativity indices were generated first for the sexes separately and then combined, showing that the creativity scores tended to be fairly highly intercorrelated with each other. The average intercorrelation among creativity scores was .41. There are 39 items in the tests and each item has two scores. Thus there are 78 item-sum correlations. All of the item-sum correlations were .40 or higher, and 71 of the 78 item-sum correlations were .60 or higher. By using Spearman-Brown prophecy formula, the split half

reliability was calculated. Eight of the ten coefficients exceeded .80, showing that the measures had high internal consistency. Item analysis was also carried out to see the extent to which every item was contributing to the score provided by the sum of all items. It was found out that all items made substantial contributions to the total score.

In Chan et al.'s (2001) study, by using the internal consistency measures, the Chinese version of the test yielded moderate reliability coefficients (ranging from .65 to .86 for the five tests). They were slightly lower than those of the original tests but were considered acceptable as only two items were used for each test. Chan et al. (2001) also found out from factor analyses, that the ideational fluency derived from verbal and figural tests could be different, though the two sets of scores were highly correlated. This difference supported the verbal and figural distinction in ideational performances. In addition, fluency scores from non-verbal tasks appeared to offer higher reliability than those from verbal tests, as shown by the Cronbach's coefficient alpha values.

3.3.2. A Survey of TV Viewing Habits

This study adopted relevant items from a TV viewing log and a family interview schedule developed by Singer and Singer (1981). All items and instructions were translated from English into Chinese and back-translated from Chinese into English to ensure that the original meanings were retained in the Chinese version.

The questionnaire used in this study consisted of 24 items. Most of the items are closed-ended, except when participants were asked to list examples of TV programs, specify other information, state the time children spent on TV viewing and other activities. The questionnaire consisted of four groups of questions.

First, six questions about a child's TV viewing preferences and habits were asked in the survey, which were about the amount of time a child spent on watching TV each week, when and why a child watched TV, what were the favorite and most frequently watched TV programs or categories, and the intensity of attention a child paid on TV watching at home. Two questions about fright reactions during and after watching TV programs were asked.

Second, nine questions about parental guidance in TV watching were included to find out about the amount of freedom of a child in selecting TV programs, rules parents imposed on their viewing, the frequency of discussion and comments on the programs watched, and the amount of interaction between parents and their child during TV viewing.

Third, six questions regarding other home activities were asked in the survey, such as storytelling and reading for the child by their parents or other adults in the family, and other activities a child engaged in alone or with their parents at home. These variables might exert influence on child's creativity, moderate the effects of TV viewing on creativity or compete with TV viewing in terms of child's time and effort.

Lastly, information on personal or family particulars was obtained. Family information referred to: (a) family members living together with the child, (b) parents' occupations, (c) parents' educational levels, and (d) about number and age of the child's siblings. In addition, information on school name, class name, student number and the child's gender was also collected.

3.4. Procedure

In August 2002, the researcher of this study gained the consent of two schools via two respective teachers to participate in the study. The sample schools also agreed with the random selection of two classes from each school. Letters were then sent by the schools to the parents to seek their agreement to participate in the study. Replies were received from parents in September 2002. At the same time, the researcher negotiated with the schools to arrange an appropriate time for the creativity tests.

With reference to Wallach and Kogan's original study, the researcher also explained to respective teachers and principals that this study was not concerned with students' academic achievements to avoid creating a stressful atmosphere for the children. This message was also conveyed to parents via the teachers.

A small group of ten Grade 2 children and their parents were asked to be the participants for pilot study conducted in late November 2002. These children were from a class in the sampled school but the class was not selected for the main study. The purpose of

the pilot study was to examine the appropriateness of testing logistics, the testing time and the wordings of the questionnaire.

The family's TV viewing habits questionnaires were distributed to parents of the sampled children via their class teacher in early December 2002. All mothers or fathers of the sampled children were invited to complete the survey together with their children at home within December 2002 and hand in the completed questionnaire to respective teachers for forwarding to the researcher of this study by the end of December 2002. Each student's school name, class and class number was used as individual identifiers to link up the creativity tests scores and the TV viewing habits questionnaire. It was also arranged that group findings of the study might be released to the parents and teachers for their reference.

The creativity test was administered to each child individually in a playroom or classroom in the school. The basic aim was not to give the child any time pressure, though the estimated duration for each child to complete the tests was around 70 minutes, as found out by Chan et. al. (2001). In addition, the children were required to respond to the questions orally, as they might not be good at expressing their ideas in writing at that age.

The test procedure was similar to those of Chan et al. (2001). The experimenter was introduced to the children as a visitor to the school who would like to play games with children. Then all procedures were described to a child as games. To break the ice and to

make the coming tests more like a game, a warm up game was played with each child before starting the real creativity tests.

In the beginning of the 'instances' waq test, the experimenter told the child that she would name something and the child had to name as many things as he or she could think of that were like what she named. Then she gave some examples to make sure that the child understood the instructions. When the child showed that he or she understood how to play the game, the real tests began.

Around one month was required to conduct the tests with the sampled children, during or after the Christmas party or the post-examination period in December and January 2002 so that children might participate under a more relaxed atmosphere. The administration procedures were done by the researcher alone who was in her mid-twenties. As Wallach and Kogan mentioned in the notes of study, female experimenter was appropriate as elementary school children were considerably more comfortable in encountering adult females than males.

3.5. Statistical Analyses to test the Hypotheses

Univariate ANOVA was used to test Hypothesis 1. Pearson Correlations analysis was employed to test Hypotheses 2, 4, and 6. Independent sample t-tests were utilized for Hypotheses 5 and 7. Linear regression analysis was used to test Hypothesis 3. Lastly, the overall effects of different independent variables on the dependent variables were tested by

using hierarchical linear regression analysis. All of these statistical analyses were performed using routines of Statistical Package for the Social Sciences (SPSS 11.0).

Results

This chapter will first introduce the results of the reliability analysis of the two instruments used in the study. Then the frequency distribution of key variables will be reported. Lastly, results pertaining to hypotheses testing will be presented.

4.1. Reliability Tests

Split-half reliability measures (Table 3) for the creativity tests, with the sample size of 98 children, show that, for each of the sub-variables and each of the dimensions, the coefficients ranged from moderate to substantial. All 12 of these reliability estimates were .55 or higher. Five of the 12 coefficients exceeded .81. The four coefficients of the figural dimension, i.e. overall figural scores, and figural scores for originality, fluency, and flexibility items exceeded .90. Those for the verbal dimension were only moderate and ranged from .55 to .69. Among the three sub-variables, originality scored the highest reliability coefficient of .81. In comparison, eight of the ten split half reliability coefficients exceeded .80 in Wallach and Kogan's study (1965). It however should be noted that the present study only adopted ten of the 39 items used in Wallach and Kogan's study, thus might yield different magnitudes of coefficient values.

In order to compare with the alpha values found in Chan et al.'s study, the Cronbach's alpha values of verbal and figural fluency scores as well as values of the ten creativity tests were additionally calculated in this study. For fluency (number of responses), the data obtained in the present study with the creativity instruments yielded reliability coefficients of .93 to .98, which were higher than the coefficients of .65 to .86 reported in Chan et al.'s study (2001). It might be due to the fact that first-, second- and third-graders were chosen as participants in Chan et al.'s study while only second-graders were invited to participate in the present study. The Cronbach's alpha values of verbal and figural fluency scores were .88 and .93 respectively in Chan et al.'s study (2001). In comparison, these two values were .80 and .99 in our study, with the former being lower and the latter being higher than Chan et al.'s values.

Internal consistency reliabilities were also tested for the relevant items of the survey of TV viewing habits. Totally there are 24 items in the survey. The first eight items, which measured TV viewing habits and preferences, yielded reliability coefficient of .66. Items 10, 11, 16, and 17, which measured parental guidance in children's TV viewing, yielded reliability coefficient of .88. The remaining items recorded facts about TV viewing habits such as favorite TV programs. Thus reliability tests were not done for these items. And as reliability tests were not presented in Singer and Singer's study (1981), no comparison could be made for this instrument.

Table 3. Split-Half and Internal Consistency (Cronbach's Alpha) Reliability of the Ten Creativity Tests

Dimension/Sub-variable	No. of indicators (items)	Split-Half Coefficient	Alpha Coefficient
Whole Scale	30	.78	
All Verbal Items	18	.67	
All Figural Items	12	.99	
Originality (All items)	10	.81	
Originality (Verbal items)	6	.69	
Originality (Figural items)	4	.94	
Fluency (All items)	10	.61	
Fluency (Verbal items)	6	.55	.80
Fluency (Figural items)	4	.99	.99
Flexibility (All items)	10	.76	
Flexibility (Verbal items)	6	.69	
Flexibility (Figural items)	4	.96	
Originality (Instances test)	2	-	.60
Originality (Alternative Uses test)	2	-	.95
Originality (Similarities test)	2	-	.95
Originality (Pattern Meanings test)	2	-	.95
Originality (Line Meanings test)	2	-	.83
Fluency (Instances test)	2	-	.93
Fluency (Alternative Uses test)	2	-	.93
Fluency (Similarities test)	2	-	.97
Fluency (Pattern Meanings test)	2	-	.98
Fluency (Line Meanings test)	2	-	.97
Flexibility (Instances test)	2	-	.63
Flexibility (Alternative Uses test)	2	-	.97
Flexibility (Similarities test)	2	-	.96
Flexibility (Pattern Meanings test)	2	-	.94
Flexibility (Line Meanings test)	2	-	.89

4.2. TV watching behaviors

In this section, data regarding sampled children's TV viewing habits and preferences will be presented. Information on parental guidance in these children's TV viewing behaviors will also be provided.

4.2.1. TV watching preferences

Parents were first asked to report in the survey how much time their child usually spent on watching TV per day (Table 4). The average time the sampled children spent on watching TV each day was 4.01 hours ($SD=1.87$). The maximum number of hours spent was eight hours (frequency = 2) and the minimum was .50 hour (frequency = 1). Thus, on average, these children spent about 28 hours on watching TV each week. The 98 children were classified into three groups, namely, light, moderate, and heavy viewers, by using mean and standard deviation for calculation. The light viewers were classified as those spending less than 2.14 hours on TV viewing each day ($M - 1SD$). The moderate viewers were those spending between 2.14 and 5.88 hours on watching TV per day. The heavy viewers were children spending more than 5.88 hours on viewing TV each day ($M + 1D$).

Table 4. Children's Average Daily Exposure to TV Programs

	Frequency	Percentage
Light viewers (below 2.14 hours/day)	21	21.4
Moderate viewers (2.14-5.88 hours/day)	43	43.9
Heavy viewers (5.88 hours or above/day)	34	34.7

Parents were then asked about the time of the day their children usually watched TV (Table 5). The majority (58.2%) of them watched TV in the evening (i.e. 6-10 p.m.). The second largest group (22.4%) watched TV during the afternoon (i.e. noon-6 p.m.),

followed by a group watching during the morning (i.e. before noon) (18.4%). About 1% of children usually watched TV late at night (i.e. after 10 p.m.).

Table 5. Time of the Day Children Usually Watch TV

	Frequency	Percentage
Morning	18	18.4
Afternoon	22	22.4
Evening	57	58.2
Late at night	1	1.0

Parents also reported their child's most favorite and most frequently watched TV programs (in terms of categories). In the survey, parents were given nine categories to choose from in each of the two questions, and they were also asked to give examples of titles within each category chosen (Table 6). No other category was listed by parents in addition to these nine. The highest number of examples of children's most favorite programs listed by parents in the survey belonged to the category of 'cartoons'. Examples listed (in order of popularity) were *Digimon Tamers* (數馬暴龍), *Hamtaro Tales* (哈姆太郎), *Buzz Lightyear of Star Command* (巴斯光年), *Chibimaruko-Chan* (櫻桃小丸子), *Micro* (微星小超人), *Cyborg Kuro-Chan* (超級小黑咪), *Motto! Magical DO-RE-MI* (小魔女 DOREMI). The highest number of examples of children's most frequently watched programs listed by parents in the survey belonged to the category of

‘action/adventure/detective/potentially violent shows’. Examples listed (in order of popularity) were *The Monkey King - Quest For The Sutra* (齊天大聖孫悟空), *Golden Faith* (流金歲月), *Take My Word For It* (談判專家), *Armed Reaction III* (陀槍師姐 III), *Healing Hands II* (妙手人心 II). An example of ‘Children's shows (commercial TV)’ given by parents was *Kids Click* (至 Net 小人類). One example listed for ‘Family comedy’ was *Virtues of Harmony* (皆大歡喜). Two examples for ‘Variety/Game shows’ were *A Trio Delights* and *Movie Buff Championship* (超級無敵掌門人). An example listed for the category ‘Adult-Family shows’ was *Family Man* (絕世好爸).

The two categories of most favorite and most frequently watched programs were ‘cartoons’ and ‘action/adventure/detective/potentially violent shows’. By further analyzing the data, it was found out that 19 parents reported that their child's most favorite and most frequently watched were ‘cartoons’, whereas 22 parents reported that their child's most favorite and most frequently watched were ‘action/adventure/detective/potentially violent shows’.

Table 6. Child's Favorite and Most Frequently Watched TV Programs

<u>Program Categories</u>	<u>Most Favorite</u>		<u>Most Frequently watched</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Cartoons	31 @	31.6	28	28.6
Children's shows (commercial TV)	11 @	11.2	0	0.0
Educational programs/public TV programs	6 @	6.1	0	0.0
Family comedy	10 +	10.2	9	9.2
Games/variety shows	17 +	17.3	11	11.2
Adult-family shows	1 +	1.0	0	0.0
Actions/Adventure/Detective/Potentially violent programs	22	22.4	50 #	51.0

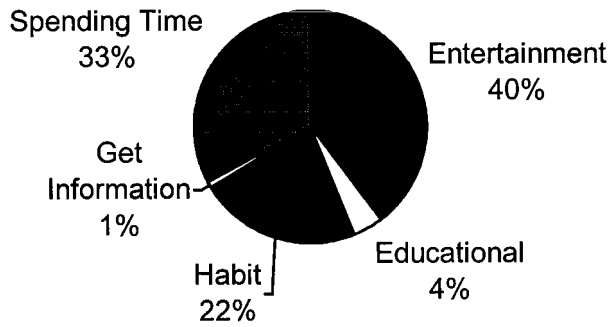
Note: # = Group V; @ = Group C;

As observed and reported by parents, most of the children (57.2%) concentrated more on watching TV than on doing other things simultaneously (Table 7).

Table 7. Child's 'Concentration' on the TV Programs

	Frequency	Percentage
Not concentrated	2	2.0
Occasionally watch	5	5.1
Half/Half	35	35.7
Occasionally moves away	23	23.5
Very concentrated	33	33.7

Parents were also asked to choose one from the five categories to indicate the main reason for the TV watching by their child. Graph 1 shows that most of the children did it for entertainment (39.8%), and the least for educational or informational purposes.



Graph 1. Reasons of the child to choose watching TV

Table 8. TV Shows the Child Usually Watched Alone and With Family Members

Programs Categories	<u>Watch alone</u>		<u>Watches with family</u>	
	<u>Frequency</u>	<u>Percentage</u>	<u>Frequency</u>	<u>Percentage</u>
Cartoon	71	72.4	0	0.0
Children's shows (commercial)	20	20.4	0	0.0
Educational programs/public TV programs	1	1.0	0	0.0
Family comedy	0	0.0	23	23.5
Games/variety shows	0	0.0	23	23.5
Adult-family shows	0	0.0	15	15.3
Action/Adventure/Detective/ Potentially violent programs	6	6.1	36	36.7
Missing	0	0.0	1	1.0

As indicated by parents in the survey, majority of the children watched 'cartoons' alone (72.4%) and 'action/adventure/detective/potentially violent shows' with their family (36.7%) who might provide some guidance (Table 8). It was expected that these two kinds of TV programs would exert much influence on children's creativity.

Regarding fright reactions of the children during and after watching TV, data shows that 20.4% of them often or always had fright reactions during watching, while 14.3% of

them often or always had nightmares after watching. 27 out of 98 children sometimes or often or always had fright reactions or nightmares both during and after viewing (Table 9).

Table 9. Child's Fright Reactions During and Nightmares After Watching TV (N=98)

	Fright reactions		Nightmares		Both	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Never	17	17.3	23	23.5	13	13.3
Rare	24	24.5	18	18.4	6	6.1
Sometimes	36	36.7	41	41.8	21	21.4
Often	15	15.3	11	11.2	5	5.1
Always	5	5.1	3	3.1	1	1.0
Missing	1	1.0	2	2.0	NA	NA

Further, our data indicates that parents were the one who made the decisions of TV program watched by the child alone and for the family to watch together (Table 10). In 61 out of 98 cases, parents made the decisions for both the child and the whole family. The child himself decided more often about the programs watched alone than those watched with the family.

Table 10. Family Member Deciding About Choice of Programs for the Child and for the Family

Family member who made the choice	No. of Families which had the Family	For Child Alone		For Whole Family	
		Frequency	Percentage	Frequency	Percentage
Child himself/herself	98	15	15.3	2	2.0
Parents	98	63	64.3	87	88.8
Sibling	42	5	5.1	0	.0
Maid	22	3	3.1	0	.0
Other adult at home	15	12	12.2	7	7.1
Missing Data	NA	0	.0	2	2.0

4.2.2. Parental guidance in TV watching

Tables 11, 12, and 13 list data about parental involvement in children's TV viewing behaviors. Parents were asked how often they were at home when the child was watching TV and how often they accompanied their child to watch TV, and whether they had discussion with their child before and after watching TV. The former might show the minimal parental involvement in children's TV viewing behaviors and the latter might be a higher level of involvement. As shown in Table 11, in majority of the cases (70.4%), parents were sometimes at home when the child was watching TV and sometimes watched TV together (68.4%). But there was also a portion of cases that parents were rarely at home when the child was watching TV and about 20% of parents rarely or never watched TV with their kids.

Table 11. Frequency that Parents Were At Home When the Child Was Watching TV and the Frequency They Watched TV Together With the Child

How Often	Parents at home while the was child watching TV		Parents watched TV together with the child	
	Frequency	Percentage	Frequency	Percentage
Never	0	.0	1	1.0
Rarely	13	13.3	19	19.4
Sometimes	69	70.4	67	68.4
Often	10	10.2	5	5.1
Always	6	6.1	6	6.1

Table 12. Family Member(s) Who Usually Watched TV With the Child

	Frequency	Percentage
Parents	51	52.0
Older sibling	14	14.3
Younger sibling	12	12.2
Other adults	10	10.2
Maid	10	10.2
Missing	1	1.0

Among family members, parents were the ones who watched TV with the child most frequently (Table 12). In other cases, older or younger siblings accompanied the child to watch TV. When the data in Tables 11 and 12 was compared, it was found out that within these 51 parents who claimed that it was usually them who watched TV with their child, only nine of them often or always did so.

The results also showed that very few parents often or usually discussed with the child about the TV programs before watching (only 1% of all cases) (Table 13); 20.4% of them never did so. More parents would do so after watching (18.4% often did), but 18.4% of them rarely or never did so. In addition, 20 of the parents reported that they sometimes discussed with their child about the TV programs both before and after watching.

Table 13. Indication of Whether Parents Discussed With the Child Before and After Watching TV

	Before watching		After watching	
	Frequency	Percentage	Frequency	Percentage
Never	20	20.4	5	5.1
Rare	44	44.9	13	13.3
Sometimes	32	32.7	61	62.2
Often	0	0.0	18	18.4
Always	1	1.0	1	1.0
Missing	1	1.0	0	0.0

4.2.3. Children's other activities

Only a very small portion of the parents did often tell or read stories to their child (12.2% and 20.4% respectively). More parents (25.5%) never or rarely told stories but fewer (14.2%) parents never or rarely read stories to their kids. And 44 out of 98 parents indicated that they would sometimes or often tell and read stories to their child (Table 14).

Table 14. Indication Whether Adults At Home Told or Read Stories to the Child Regularly

	Tell stories		Read stories		Both
	Frequency	Percentage	Frequency	Percentage	Frequency
Never	3	3.1	2	2.0	1
Rarely	22	22.4	12	12.2	3
Sometimes	61	62.2	64	65.3	39
Often	12	12.2	20	20.4	5
Always	0	0	0	0	0

Table 15. Parents' Response of Whether Their Child Was Physically Active

	Frequency	Percentage
Yes	69	70.4
No	27	27.6
Missing	2	2.0

Slightly more than 70% of the parents perceived their child as physically active (Table 15). Data presented in Table 16 illustrate the child's most common activities and the activities parents were usually involved in together with their child. For the child's activities, playing toys/games, playing music instruments such as piano, and doing sports were the most common. For the activities parents did with their child, shopping, playing toys/games, and going to the park were the most frequent. Among these activities, playing games and sports, and dancing may be considered as physical activities.

Table 16. Child's Most Common Activities & Activities Parents & Child Often Did Together

	Child's activities (Other than TV Watching)		Parents & Child's activities	
	Frequency	Percentage	Frequency	Percentage
Play toys/games	34	34.7	22	22.4
Play music instruments	25	25.5	0	0.0
Paint	9	9.2	0	0.0
Sports	24	24.5	7	7.1
Dance	2	2.0	0	0.0
Read	3	3.1	0	0.0
Watch TV	NA	NA	12	12.2
Shopping	0	0.0	28	28.6
Go to park	0	0.0	21	21.4
Watch movies	0	0.0	4	4.1
Tell/read stories	0	0.0	4	4.1
Missing	1	1.0	0	0.0

The average time per week children spent on leisure activities, other than watching TV, was 4.80 hours ($SD=2.23$), with the highest being 10 hours and lowest being 1 hour per week approximately. In comparison, children spent 28 hours per week on viewing TV

Table 17. Time Children Spent on Leisure Activities Other Than Watching TV Per Week

	Frequency	Percentage
3 hours and below	30	30.6
3.1-5.9 hours	38	38.8
6 hours and above	30	30.6

4.3. Children's Creativity Tests Scores: Descriptive Statistics

The sub-total scores, means, and the standard deviations of the 15 creativity test scores are presented in Table 18. The mean scores were computed by aggregating the relevant items in each of the types of divergent thinking test, and averaging them by the number of items. Overall verbal and figural *fluency*, *flexibility*, and *originality* scores were also computed by summing and averaging scores for each variable and separately for the verbal and figural domains.

The children in this study scored between 7 to 14 on the variable fluency, regardless of the type of test. Children in this study scored higher than those (all of them were fifth graders) in the study of Wallach and Kogan (1965), with the range of 4 to 11 distinct ideas, but generated less number of ideas than those (who were second graders) of Chan et al. (2001), with the range of 9 to 20 ideas. For originality score, children in Wallach and Kogan's study scored between .48 and 1.60, while in our study, children scored lower, between .39 and .70. No comparison could be made with Chan et al.'s study (2001) as they did not present originality scores of their sample.

In respect of the variable flexibility, children in this study could generate between 2.30 and 3.61 categories on average. No comparisons could be made with Wallach and Kogan's study (1965) and Chan et al's study (2001) as both if they did not include this variable in their studies.

Within the nine verbal test scores, boys scored higher than girls in five of them, and most of which were originality scores. Within the six figural test scores, girls scored higher than boys in four of them. Boys scored higher in the two tests on flexibility variable. Girls scored higher in both total verbal and figural scores. However, all these differences were not statistically significant.

Table 18. Means and Standard Deviations of Creativity Tests Scores

Dimensions	Tests/Sub-variables	Boys (n=55)			Girls (n=43)			Total (n=98)		
		Total	M	SD	Total	M	SD	Total	M	SD
Verbal Tests	Instances - originality	1.49	.75	1.05	1.28	.64	.98	1.40	.70	1.02
	Instances -fluency	29.29	14.65	8.41	28.56	14.28	7.63	28.97	14.49	8.05
	Instances - flexibility	7.04	3.52	1.91	7.44	3.72	1.94	7.21	3.61	1.92
	Alternative Uses -originality	1.02	.51	1.05	.98	.49	1.04	1.00	.50	1.04
	Alternative Uses -fluency	14.44	7.22	3.50	15.44	7.72	3.01	14.88	7.44	3.31
	Alternative Uses - flexibility	4.84	2.42	1.94	5.37	2.69	2.02	5.07	2.54	1.99
	Similarities - originality	.84	.42	.96	.67	.34	.94	.77	.39	.95
	Similarities -fluency	13.84	6.92	3.46	14.19	7.10	4.04	13.99	7.00	3.71
	Similarities - flexibility	4.71	2.36	1.49	4.47	2.24	1.71	4.60	2.30	1.58
	Originality	3.35	1.12	2.22	2.93	.98	2.08	3.16	1.05	2.16
Figural Tests	Fluency	57.56	19.19	12.82	58.19	19.40	11.06	57.84	19.28	12.02
	Flexibility	16.58	5.53	3.55	17.28	8.64	4.36	16.89	5.63	3.92
	Pattern Meanings -originality	.91	.46	.97	1.00	.50	1.00	.95	.48	.98
	Pattern Meanings -fluency	17.71	8.86	4.34	18.56	9.28	4.23	18.08	9.04	4.29
	Pattern Meanings - flexibility	4.78	2.39	1.58	4.65	2.33	1.81	4.72	2.36	1.68
	Line Meanings - originality	.87	.44	.92	.93	.47	.94	.90	.45	.93
	Line Meanings - fluency	17.78	8.89	4.46	18.70	9.35	4.63	18.18	9.09	4.54
	Line Meanings - flexibility	4.95	2.48	1.70	4.91	2.46	1.95	4.93	2.47	1.81
	Originality	1.78	.89	1.83	1.93	.97	1.90	1.85	.93	1.85
	Fluency	35.49	17.75	8.76	37.26	18.63	8.81	36.27	18.14	8.78
Flexibility -	9.73	4.87	3.24	9.56	4.78	3.67	9.65	4.83	3.42	

4.4. Relationship between TV viewing behaviors and children's creativity

Relationship between time spent on TV viewing and creativity: H1.

It was predicted that heavy viewers would score lower on creativity tests, both verbal and figural. Total scores were calculated by summing up the originality, fluency and flexibility scores of the respective tests. For the three verbal tests with two items each, the test total scores for light, moderate and heavy viewers were 73.38 ($SD=6.99$), 87.95 ($SD=9.83$) and 67.94 ($SD=19.40$) respectively. For the two figural tests with two items each, the respective total scores were 42.62 ($SD=5.95$), 52.56 ($SD=9.66$) and 44.88 ($SD=14.48$). Tests of between-subjects effects indicated that the overall main effect of the factor "time spent on watching TV" on the child's creativity (verbal and figural) was statistically significant, $F(2, 95) = 22.17, p < .001$ and $F(2, 95) = 7.51, p < .01$. The results of Univariate Analysis of Variance (ANOVA) and Bonferroni's Post-Hoc Tests (by Multiple Comparisons) showed that the mean difference in verbal tests score between heavy viewers and moderate viewers was statistically significant ($p < .001$), but not for heavy and light viewers ($p = .454$). Figural tests score of heavy viewers was lower than that of moderate viewers ($p < .01$), but that of heavy and light viewers was not statistically significant. Hypothesis 1 was thus supported.

Univariate ANOVA was additionally conducted along the three variables of creativity, namely, *originality*, *fluency*, and *flexibility*. Time spent on TV viewing was found to have effect on children's creativity scores. The effect seems to be stronger on verbal *fluency* and *flexibility* than on figural ones (Table 19).

Table 19. ANOVA Summary Table Showing F-test Results for Effects of Time Spent on TV Viewing on Creativity Scores

<u>Source</u>	<u>df</u>	<u>F</u>	<u>p</u>
<u>Verbal Originality Score</u>	<u>2,95</u>	<u>10.12</u>	<u><.001</u>
<u>Figural Originality Score</u>	<u>2,95</u>	<u>10.61</u>	<u><.001</u>
<u>Verbal Fluency Score</u>	<u>2,95</u>	<u>20.24</u>	<u><.001</u>
<u>Figural Fluency Score</u>	<u>2,95</u>	<u>4.16</u>	<u><.05</u>
<u>Verbal Flexibility Score</u>	<u>2,95</u>	<u>15.91</u>	<u><.001</u>
<u>Figural Flexibility Score</u>	<u>2,95</u>	<u>9.77</u>	<u><.001</u>

Relationship between types of programs viewed and creativity: H2, 4.1., & 4.2.

It was hypothesized that in viewing different types of TV programs, there would be different directions of correlations with children's creativity. First, a negative correlation between viewing violent shows and the child's creativity was predicted by hypothesis 2. To test this hypothesis, the cohort of children was divided into two groups, one of which frequently viewed potentially violent programs (group V, $n=50$), and the other frequently viewed other types of programs (group N, $n=48$). Detailed information of these data is presented in Table 6 in the previous section.

The results of Pearson Correlations showed that the correlation between viewing violent shows and the child's creativity scores in verbal tests was moderate, negative, and statistically significant ($r = -.30, p < .01$). The correlation between viewing violent shows and the child's creativity scores in figural tests was low, negative, but not statistically significant ($r = -.10, p = .34$). Hence hypothesis 2 was partially supported.

Hypotheses 4.1 and 4.2 predicted a positive correlation between viewing educational/children programs, or non-violent adult shows, and the child's creativity. To test hypothesis 4.1, the cohort of children was divided into two groups, one of which reported that their favorite programs were educational/children shows (group C, $n=48$), and the other reported that their favorite programs were other types of shows (group O, $n=50$). Details of the distribution of children's favorite TV programs were reported in Table 6 in the previous section. "Favorite programs" was chosen instead of "Most frequently watched programs" in this case because this categorization could include more cases and varieties. The results of Pearson Correlations showed that the correlation between viewing educational/children shows and the child's creativity scores in verbal tests was moderate, positive, and statistically significant ($r = .28, p < .01$). The correlation between viewing these shows and the child's creativity scores in figural tests was low, positive, but not statistically significant ($r = .10, p = .34$). Hence hypothesis 4.1 was partially supported. It was predicted by hypothesis 4.2 that there would be a positive correlation between viewing non-violent adult programs and the child's creativity. The cohort of children was divided into two groups, one of which reported that their favorite programs were non-violent adult shows (group A, $n=28$), and the other which reported that their favorite programs were other types of shows (group O1, $n=70$). Details of the distribution of children's favorite TV programs were reported in Table 6 in the previous section.

The results of Pearson Correlations showed that the correlation between viewing non-violent adult shows and the child's creativity scores in verbal tests was very low, positive, and not statistically significant ($r = .04, p = .69$). The correlation between viewing these shows and the child's creativity scores in figural tests was low, negative, and not statistically significant ($r = -.07, p = .52$). Hence hypothesis 4.2 was not supported.

Relationship between types of programs viewed and creativity as moderated by amount of time spent on watching the given type of program: H 3, 5.1, and 5.2.

Hypotheses 2, 4.1, and 4.2 predicted that viewing different types of TV shows might have different effects on creativity. Hypotheses 3, 5.1, and 5.2 went further by predicting that the length of time in watching the given type of TV shows would also have an effect on children's creativity.

Hypothesis 3 predicted that within the group of children who frequently view violent shows, the length of time in viewing these shows would have a negative effect on their creativity. To test the effect of frequency of watching violent programs on creativity scores, the creativity scores of group V ($n=50$, table 6 refers) were entered into linear regression equation. The results showed that the variance explained by the length of time was 37.8%, as indicated by adjusted R^2 . The standardized beta coefficient was moderate ($\beta = -.625$) and statistically significant ($p < .001$). Therefore, hypothesis 3 was supported.

It was predicted by hypothesis 5.1 that moderate viewers of educational/children shows would have higher creativity test scores than heavy viewers. To test it, the group C ($n=48$, table 6) was selected for analysis, which was further divided into two sub-groups. One group included moderate viewers and the other consisted of heavy viewers.

The descriptive statistics show that, total verbal tests scores of moderate and heavy viewers were 89.55 ($SD=9.77$) and 80.90 ($SD=20.37$) respectively, and those of figural tests were 51.50 ($SD=11.04$) and 52.80 ($SD=15.19$) respectively. The independent samples t-test result for the verbal tests scores was $t(30) = 1.64, p = .11$ and for figural tests scores was $t(30) = -.274, p = .786$. Thus hypothesis 5.1 was not supported.

In hypothesis 5.2, it was predicted that moderate viewers of non-violent adult shows had higher creativity test scores than heavy viewers. To test it, the group A (Table 6) was selected for analysis, which was further divided into moderate and heavy viewers groups. The descriptive statistics showed that, the verbal tests scores of moderate and heavy viewers were 84.60 ($SD=8.63$) and 72.75 ($SD=19.94$) respectively, and those of figural tests were 50.33 ($SD=5.34$) and 42.50 ($SD=12.15$) respectively. The results of the independent samples t-test illustrated that both in terms of the verbal and figural tests scores, the difference between these two groups of children was statistically significant. The respective t values were $t(21) = 2.01, p < .05$ and $t(21) = 2.17, p < .05$. Hypothesis 5.2 was supported.

Correlation between TV viewing with parental guidance & creativity: H 6.1. & 6.2.

Hypothesis 6.1 predicted that there was a positive correlation between TV viewing with parental monitoring in selection of programs and the child's creativity. To calculate a score of parental monitoring, the answers to items 9, 10, 11, 12, and 13 in the survey were recoded into scores ranging from 0 to 2 (lowest to highest level of monitoring) and summed up. The total actual scores ranged from 0 to 7.

The Pearson correlation coefficient between TV viewing with parental monitoring in selection of programs and the child's creativity scores in verbal tests was moderate, positive, and statistically significant ($r = .38, p < .001$). Whereas, in figural tests it was low, positive, but statistically significant ($r = .21, p < .05$). Hence hypothesis 6.1 was supported.

Hypothesis 6.2 predicted that there would be a positive correlation between TV viewing with parental mediation/moderation and the child's creativity. To calculate a score of parental moderation, the categories of answers in the survey (Table 13) were recoded into scores ranging from 0 to 2 ('never' and 'rarely' = '0', 'sometimes' = '1', and 'often' and 'always' = '2') and summed up. The total actual scores ranged from 0 to 4.

The Pearson Correlation coefficients were then calculated, which showed that the correlation between TV viewing with parental moderation and the child's creativity scores in verbal tests was very low, and positive ($r = .03, p = .76$), while in figural tests was very low, and negative ($r = -.02, p = .83$). Hence hypothesis 6.2 was not supported.

Relationship between TV viewing with parental guidance and creativity as moderated by amount of time spent on TV watching: H 7.1. and 7.2.

Hypotheses 6.1 and 6.2 predicted that TV viewing with parental guidance might be positively correlated with children's creativity. Hypotheses 7.1 and 7.2 proceeded further by predicting that the length of time in watching TV would also have effect on the relationship between parental guidance in TV viewing and children's creativity.

Hypothesis 7.1 predicted that moderate viewers with parental monitoring in selection of TV programs would have higher creativity tests scores than heavy viewers. The descriptive statistics showed that moderate viewers with high parental monitoring had higher total verbal and figural scores ($M=91.76$, $SD=9.40$ and $M=53.82$, $SD=11.92$ respectively) than heavy viewers ($M=79.86$, $SD=15.35$ and $M=51.71$, $SD=12.74$ respectively). The results of the independent samples t-tests showed that the difference between the groups was statistically significant in terms of the verbal tests scores, $t(22) = 2.34$, $p < .05$, but not in figural tests, $t(22) = .39$, $p = .70$. This hypothesis was partly supported.

Hypothesis 7.2 predicted that moderate viewers with parental moderation would have higher creativity tests scores than heavy viewers. Moderate viewers with high parental moderation had a higher total verbal but lower total figural test scores ($M=80.26$, $SD=3.53$ and $M=52.21$, $SD=6.99$, respectively) than heavy viewers ($M=71.00$, $SD=2.83$ and $M=66.00$, $SD=11.31$, respectively). The independent samples t-tests showed that the difference between

these two groups was statistically significant in both verbal and figural tests, $t(19) = 3.57, p < .01$ and $t(19) = -2.55, p < .05$ respectively. This hypothesis was partly supported, as the difference in figural test scores was not in the expected direction. It is speculated that as TV programs present messages mainly in verbal forms, TV viewing has positive effects on verbal but not figural creativity.

4.5. Relationship between TV viewing habits parental guidance, leisure activities and creativity

Hierarchical linear regression analysis was performed to evaluate the effects of all factors associated with TV viewing habits and leisure activities on children's creativity (Table 20). The factors included in model 1 were demographic variables, namely, the child's gender and age, father and mother's occupation and education level. The total variance explained by this model was 21.2%. Specifically, only the relationship between father's education level and the child's creativity level was positive and statistically significant ($p < .01$).

In model 2, 'amount of time spent on TV viewing' was added. Total variance explained was still 21.2%. The relationship between amount of time spent on watching TV and creativity was not statistically significant when controlling for demographic variables. This seems to be due to the confounding effect of the father's education level on the child's creativity.

In model 3, types of most favorite and most frequently viewed TV programs were added. This model explained 2.1% more variance in the sample. Though the relationships between the types of most favorite and most frequently viewed TV programs, and creativity were not statistically significant when controlling for demographic variables, both were in the directions predicted by hypotheses 2 and 4.

In model 4, the factors on parental guidance were added. The relationships between creativity and factors of parental monitoring and moderation were statistically significant ($p < .01$), but in different directions. These results were consistent with those described in section 4.4 (regarding hypotheses 6.1 and 6.2). These two variables accounted for 14.2% more variance in creativity scores.

In the last model, factors about children's other activities at home were added, relationships between which and creativity were all not statistically significant. The total variance explained by model 5 was 41.3%, with incremental of variance being 3.9%.

Table 20. Summary of Hierarchical Regression Analysis for Variables Predicting Creativity Levels among Hong Kong Grade 2 Children

Predictors	Creativity Levels				
	Model 1	Model 2	Model 3	Model 4	Model 5
Step 1:					
Child's Gender	.023	.023	.041	-.062	-.104
Child's Age	.010	.010	-.027	-.043	-.022
Father's Occupation	-	-.193	-.164	-.131	-.106
Mother's Occupation	-	-.140	-.133	-.140	-.142
Father's Education Level	.510**	.510**	.510**	.509**	.487**
Mother's Education Level	-	-.222	-.199	-.339	-.322
Step 2:					
Amount of time spent on TV viewing		.001	.081	-.311	-.375
Step 3:					
Most favorite programs: Child/Educational shows			.127	.008	.006
Most Frequently viewed programs: Violent shows			-.076	-.042	-.046
Step 4:					
Parental Monitoring				.413**	.526*
Parental Moderation				-.659**	-.557**
Step 5:					
Activities done by parents and child together					-.084
Most common leisure activities done by child					.041
Parent's storytelling habits					.121
Parent's story-reading habits					-.057
Amount of time spent on other leisure activities					-.315
Multiple R	.460**	.460**	.482**	.612**	.643**
R ²	.212**	.212**	.233**	.374**	.413**
Incremental R ² Change	.212**	.000	.021	.142**	.039

Note. N = 98, *, p < .05, **, p < .01. Table entries are standardized beta weights for each regression model.

Discussion and Conclusion

The objective of the present study was to investigate the relationship between children's TV viewing habits and their creativity. In this chapter, an interpretation of the results, in the light of existing literature, will be presented. Possible theoretical and practical implications will be indicated. Limitations of the study and recommendations for future research will be discussed.

5.1. Relationship between length of time spent on TV viewing & children's creativity

Given the time children spent every day at home, our study found that Hong Kong children (age $M=7.42$) spent on average 4.01 hours on TV viewing per day, which was longer than the amount of time adults spent (3.6 hours per day) (MDR Technology, 1994). The above finding could be a source of concern for educators as data from this study found strong and negative effect of heavy TV viewing on creativity scores. Findings from this HK study are consistent with the conclusions from Furu's (1971, as quoted in MacBeth, 1996), Wade's (1971, as quoted in MacBeth, 1996), Singer and Singer's (1981b), and MacBeth's studies (1996). Thus, regardless of cultural differences, long time spending in front of TV is associated with low creativity.

One reason why heavy viewers score lower on creativity test could be that more creative kids spend less time viewing TV (MacBeth, 1996). Another explanation is the

Displacement Hypothesis quoted by Howe (1983). The negative and significant correlation between time spent on TV viewing and time for other leisure activities found in this study ($r = -.82, p < .01$) supports Howe's hypothesis and indicates that TV may replace other more creativity-stimulating activities. Williams (1986) argues that though TV apparently narrows the range and number of other leisure activities, a simple displacement explanation is inadequate. He suggests that the effect may be more motivational than directly time related. The availability of TV and the habit of being a regular viewer, as evident in our study, over 50% of the children watched TV for spending time or due to habits, may make children less likely to think of any alternative activities.

In addition, Williams has also concluded (1986) that the format and content of TV might not be optimal for development of information-processing skills which facilitate creative thinking. He has argued that watching TV does not require children to elaborate. When tested in the form of print or writing and in problem-solving skills, children may then be less willing to expend mental effort as they consume fantasies produced by others. Collins (1982, as quoted in Williams, 1986) also contends that the pace and format of TV make children develop "let you entertain me" orientation and discourage reflection, which is an important aspect of creative thinking.

5.2. Relationship between types of programs children watch and their creativity

If the program content is considered, findings of this study offer support to the

conclusion that viewing violent TV programs is negatively correlated with the child's creativity and the relationship is statistically significant, regarding verbal creativity scores ($p < .01$). Proceeding further, the amount of time children spent on watching violent programs also negatively affects children's creativity ($R^2 = .378, \beta = -.625$). In other words, not only viewing violent shows, but also spending more time watching these shows have statistically significant negative relationship with creativity tests scores (Hypothesis 3). Similar findings have been reported in Singer and Singer's study (1981b), in which preschool boys whose play was most imaginative were those who watched fewer action-adventure programs, thus indicating that program type might play an important role in the relationship between viewing and imagination.

One explanation of the above findings is offered by the *Anxiety Hypothesis* (MacBeth, 1996). Violent TV programs might generate fright reactions in children during or after viewing, and lead to regression in behavior, and then undermine creativity. In the present study, over 27.50% of the children sometimes, often, or always experienced both the fright reactions during TV viewing and the nightmares after TV watching. The correlations between frequent viewing of violent TV programs and fright reactions or nightmares were both positive and statistically significant ($r = .36, p < .01$ and $r = .41, p < .01$, respectively).

Alternatively, viewing some other types of programs may provide children with benefits regarding creativity. Our findings support the notion that there is a positive

correlation between viewing educational and/or children programs, such as cartoons, and children's verbal creativity test scores. Similar results were found in Singer and Singer's study (1981b), in which boys whose play was most creative were those who watched more comedies. Still some other observational studies (Van Der Voort & Valkenburg, 1994) show that children do use TV content in fantasy play, both during and after viewing. Once again, these findings indicate that program content or the types of program viewed do matter. Moderate viewers of these programs have higher verbal creativity scores than heavy viewers, however, the difference is not statistically significant.

The positive effect of viewing specific TV programs might be explained by the *Stimulation Hypothesis* (Valkenburg, as quoted in Singer & Singer, 2001) and the social learning theory (Bandura, 1977, 1986, & 2002). To children, watching TV might be an active process in many ways similar to reading, during which information is selectively gathered. This may lead to improvement in the quality or quantity of creative products (Schneider, 1987). Creative models have to be present in the TV programs for children to learn by example, so that they can draw a source of ideas for use in a fantasy play and activities involving creative thinking. However, some of the experiments suggest that the stimulation effect of programs designed to increase creativity or fantasy play is limited to children originally low in imagination or creativity and to play contexts with play materials related to the program seen (Tower, et al., 1979 and Friedrich-Cofer et al., 1979, as quoted in Van Der

Voort & Valkenburg, 1994). The present study has not specifically addressed these issues.

Regarding the non-violent adult TV programs, the results of this study are inconclusive. Correlations between viewing non-violent adult shows ($n = 28$), such as family comedies and variety shows, and the child's verbal and figural creativity were both low and statistically not significant. Moderate viewers of these programs were found to have higher verbal and figural creativity scores than heavy viewers. Various experimental studies also indicate that TV programs with low level of violence and action neither increase nor decrease fantasy play or creativity. Some experimental research suggests that children's creativity is promoted only by programs that are specifically designed to stimulate imaginative or creative play (Van Der Voort & Valkenburg, 1994).

5.3. Parental involvement in children's TV viewing habits and children's creativity

Data from this study in respect of parental monitoring and moderation are inconclusive as only one out of four sub-hypothesis has been fully supported. Our findings partly support that children's creativity may benefit from limited, selective, partly supervised TV viewing. Parental monitoring in selection of programs show moderate correlation with verbal and low correlation with figural creativity test scores ($p < .001$ and $p < .05$, respectively). Parental monitoring was also found to be a good predictor of creativity scores ($\beta = .413$). However, parental moderation, conceptualized as discussion of TV programs, proved to have a negative relationship with children's creativity scores ($\beta = -.659$). It is somewhat puzzling,

that the moderate viewers' verbal creativity scores were higher than those of heavy viewers ($p < .05$) when parental monitoring and moderation level was high. However, under the high parental monitoring conditions there was no difference in figural creativity test scores between the heavy and moderate viewers, whereas, heavy viewers' figural test scores were higher than moderate viewers' in the conditions of high parental moderation. Further studies should be carried out to investigate whether there are specific types of parental involvement in children's TV viewing adopted by parents in the Chinese culture, which result in these findings as compared to previous studies done in the West (Singer & Singer, 2001). Parental moderation by HK parents might be in the form of imposing their own ideas on their children, instead of discussing with them.

Researchers in the West claim that parents or adult do exert important influence on children's creativity. Singer and Singer (1976) claim that although TV viewing may impede creativity and self-play time of young children, adult mediation can make a real difference in developing children's imagination, by controlling or manipulating the TV viewing, or by parent-child communication to transmit attitudes and viewpoints to the child. Such mediation can affect and offset TV's negative influence and enhance its positive influence on children's imagination (Signorielli, 1991; Huston-Stein, Fox, Greer, Watkins, & Whitaker, 1981; D.G, Singer & Singer, 1976, 1981).

Singer and Singer (1976) also finds that mothers who foster make-believe play through story-telling tend to take a more active role in monitoring the TV viewing habits of the children, and to place greater emphasis on TV programs that are less likely to be directly aggressive or violent. The present study also found a positive and statistically significant relationship between parent's storytelling habit and monitoring of their child's TV viewing habits ($r = .373, p < .001$). However, little is known about the full process by which parental influence functions to act upon the effects of TV viewing on the child's creativity.

5.4. Children's other activities and their creativity

The hierarchical regression analysis has shown that neither other activities in which children are involved nor parents' storytelling or story reading habits are good predictors of children's creativity. This finding does not support earlier research suggesting that more creative older children do indeed report that their parents were telling them stories when they were younger (Singer, 1961 & 1973, as quoted in Singer & Singer, 1981a), and concluding that the best predictors of the child's imaginativeness is the report that 'mother tells stories' and 'mother accepts child' (Shmukler, 1978, as quoted in Singer & Singer, 1981 a). Clearly the establishment of a warm atmosphere and encouragement of creativity by story-telling are significant parts of the internalization process. More should be explored regarding parental creation of warm atmosphere, acceptance of the child, and storytelling habits in Hong Kong.

As presented in Table 20, all factors regarding children's other activities at home or after school were also statistically not significant in predicting children's creativity. It seems that these findings are not consistent with those predicted by Singer and Singer (2001). But if one takes a closer look into the issue, one may find that some of the activities the parents and their child get involved in, such as shopping and sports activities, may not be able to stimulate creativity or may even hinder it. In Singer and Singer's study (1981b), it was also found that heavy TV viewers, who scored lower in creativity tests, tended to show more interest in team sports such as football. These children also spent much time with their parents shopping. And thus it is also speculated that the more time spent on these activities, the lower maybe the creativity of the child (Singer & Singer, 1981 b).

5.5. Factors predicting Hong Grade 2 children's creativity level

The results of the hierarchical regression analysis show that the three statistically significant predictors of the child's creativity were father's education level, parental monitoring, and moderation of children's TV viewing behaviors. The finding that parental monitoring of children's TV viewing habits had positive effect on children's creativity is consistent with findings of previous studies. However, parental moderation, i.e. parent-child discussion of TV programs watched, had negative effect on the child's creativity. This finding is inconsistent with other studies. Thus, further research is needed to investigate the unique nature of these moderations in Hong Kong families.

The variance explained in children's creativity scores by the final model (Table 20) was only moderate in magnitude (41.3%). It is speculated that other equally or more important factors, such as school effect and individual child's predisposition to engage in creative play, should be added to the model to boost up the variance explained.

5.6. Limitations of the study and Recommendations for future studies

Due to limited time and resources, the study had been restricted to 98 children and 98 parents, and it was a convenience sample. A broader and more random sampling frame in future studies may provide data for a proper generalization. Obtaining a reliable and valid measure of amount of TV viewing and types of programs viewed (i.e. TV content viewed) was difficult. Some problems with the measure include the reliability of children or parents' judgment, possibility of social responses biases. This study tested children's creativity by asking them questions verbally. There are also difficulties in doing so. The creativity task in this study may not be appropriate to identify verbal and figural creativity of young children as their ability may not have been developed maturely enough to manage the task. As reported by Torrance (as quoted in Bracken, 2000), among first grade children, even some skilled teachers are unable to elicit verbal responses from certain children. He suggested that in designing instruments and procedures for testing creativity of young children, one should have tasks which permit children to respond to modalities appropriate to their developmental characteristics, include sufficient warm-up and motivation, include tests which sample the

kinds of creativity that are important in the lives of such children, and have tests easy to administer and score.

In addition, the present study mainly aimed at examining the correlational nature and characteristics between the dependent and independent variables. Future research can consider manipulating experimental designs, or taking the form of longitudinal causal-correlational research to serve the purpose of detecting effects of TV on children's creativity in longer term.

As mentioned, factors other than TV viewing and parental guidance, such as school's influences, and children's predisposition to engage in creative play, might exert equal or larger amount of influence on a child's creativity. Future studies on the explanatory hypotheses should investigate more background variables that may moderate the relationship.

Some hypotheses proposed by Valkenburg (as quoted in Singer & Singer, 2001) have not been tested empirically in this study. In addition, in the present study, no explanations can be provided by existing literatures for the problem of no significant difference between heavy and light viewers in creativity scores. Hence future researchers may also consider furthering their investigations in these areas.

5.7. Final Thoughts

By its very nature, TV seems to be a medium that emphasizes those very elements that are generally found in creativity - visual fluidity, flexibility, and "make-believe". One

may expect TV programs to stimulate children's creativity and serve a constructive role in socialization, though evidence seems to suggest otherwise. Singer and Singer (1981b) suggest that with appropriate adult mediation the medium can be used to stimulate spontaneous imaginative play in children. Perhaps the counteraction can be achieved by two simple steps: limiting the time children spend on TV viewing to prevent displacement effect (the criteria needed for determining the optimal time also calls for further research), and stimulating children to choose programs that enhance, or at least do not interfere with, creativity.

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