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The Influence of Parent-Child Toys and Time of Playing Together on Children's Problem-Solving Skills in the Early Post-COVID Years

Tien-Ling Yeh

Xero AU, Canberra, ACT 2601, Australia

ABSTRACT

The COVID-19 pandemic has significantly impacted family lifestyles, children's capabilities, and parent-child interactions. This study aimed to explore the influences of parent-child interactions with toys and playing time on children's problem-solving abilities in post-COVID-19. The research process included two phases: (1) Literature Review: The relationship among playtime, toy types, and children's capability to solve problems; and (2) Questionnaire Analyses. The questionnaire focuses on the influences of different types of parent-child toys and the time of playing together for age 2–6 kids on problem-solving skills. Choosing 32 questions from Social Problem-Solving Questionnaire (SPSQ) and Problem-Solving Style Questionnaire (PSSQ), preschool education specialists designed this questionnaire. Questionnaires were distributed in December 2023, and 30 of them were collected. The results are as follows. (1) Learning toys with numbers and symbols that aid in reading can help develop children's logical thinking, thereby enhancing problem-solving skills. When parents and children engage in studying picture or illustration books together, it nurtures children's language capabilities and fosters interest in learning. Furthermore, sensory-motor playthings have a significant impact on the language development of children; and (2) Children from families with accompanying playtime during 17:00–18:00 (before school time) or 21:00–22:00 (before/during bedtime) showed good analytical problem-solving capabilities. When faced with a complex problem, these children could identify the most crucial factor and, if they encountered a bottleneck, they would review the problem's context and related conditions to devise alternative solutions.

Keywords: Post-COVID-19, Dual-income families lifestyles, Problem solving, Parent-child interactions, Toys

INTRODUCTION

The COVID-19 pandemic has brought about unprecedented disruptions and profound changes to family life and education. The emergence of COVID-19 led to strict containment measures, including the closure of schools and day-care services, which significantly impacted families. Overnight, parents were forced to juggle their professional responsibilities, including telecommuting, while also managing the care and education of their children at home. These challenges continue to reverberate in the post-COVID era, reshaping the dynamics of family and education.

Based on the author's previously published articles, extending from research results and keywords to this topic, the study utilized "Piagetian Game Cognition" and "Attachment Relationship." The results showed that structured construction play materials, such as parents and children playing with building blocks, LEGO, puzzles, etc., can easily assist and motivate children to explore and learn. In this secure attachment relationship, it can stimulate a more positive attitude in children. If parents and children engage in playing structured construction toys together for an average of one hour each time, it can still generate a moderately intense attachment relationship. According to Kiromi (2018) stated that in role-playing, children create very familiar places and scenes, such as imitating the behaviours of family members and playing different roles around them. Through role-playing, children can increase their vocabulary. This is a way for them to practice communication, cooperation, explore their world, mimic actions, and replicate the roles around them. Sutton-Smith's play theory (Wood, Bruner & Ross, 1976) also supports the positive impact of diversified play behaviours on children's creativity and problem-solving development. The purpose of this study is to explore the influences of parent-child toys and co-playing time on children's problem-solving skills.

LITERATURE REVIEW

Parent-Child Interactions and Problem-Solving Relationship

Rodick, Henggeler, and Hansen (1986) pointed out that positive and supportive communication between parents and children can reduce defensive reactions in children, promote problem-solving abilities, enhance empathy towards others' issues and feelings, and foster trust in interpersonal relationships. Children growing up in an environment filled with safety and encouragement are more likely to develop a sense of trust in themselves and others. They tend to express friendliness proactively and are also more likely to be liked and accepted by others (Wang, 1989). Pettit's (1988) study found that early family experiences can predict children's social abilities and problem-solving skills (cited in Lo, 1998). Naturally, a child's emotional regulation will be more positive and effective when there is such communication. Problem-solving is considered a cognitive process for individuals, and in parent-child interactions, it becomes an experience shared between them. It is a part of the overall behaviour in parent-child interactions. When parents engage in open and positive communication and interaction, providing emotional support, it is correlated with a child's performance in problem-solving.

Parent-Child Interactions and Play Relationship

In a qualitative study on family co-parenting of preschool children by Lue (2002), it was discovered that parents participating together in children's games serve as game partners, cooperate in teaching game rules, and provide ideas for problem-solving. A part of the content of parent-child interaction

involves language communication, and research has shown that parents' language use significantly influences their children's problem-solving abilities (Hess, 1965; Panetta & Swank, 1979; cited in Chan, 1989).

Among Play, Toys and Problem-Solving Relationship

In the developmental context of cognitive theory, Bruner presents different perspectives. He views games as sources of behavioural change (Rubin, Fein & Vandenberg, 1983), meaning that in games, children can experiment with various new behaviours and playstyles, which can later assist them in real-life situations that require problem-solving. Bateson's game theory emphasizes the communication system of games. The communication messages include two parts: (1) the meaning in the game - children immerse themselves in roles and focus on pretend activities and items; (2) the meaning in real life - in addition to engaging in imaginative play, children also understand the roles they and others play in real life, as well as the functions of the items used in the game in the real world. In most studies on games and cognitive development, it has been found that games contribute to enhancing children's IQ: conservation, problem-solving abilities, convergent and divergent thinking; language development and social skills (such as cooperation or emotional control), and creativity. "Exploratory play" is considered the most effective and direct way to cultivate children's proactive learning, problem discovery, and problem-solving abilities. "Exploratory play" is considered the most effective and direct way to cultivate children's proactive learning, problem discovery, and problem-solving abilities. Exploration behaviour refers to spontaneous actions not triggered by external motives, and its nature is very similar to that of games. Information obtained from exploratory behaviour influences decision-making or changes in behaviour. Early exposure to "exploratory play" can help children develop active, autonomous, and free-trial capabilities. It allows children to discover problems, use old experiences and new experiences to engage in games and exploratory behaviours, seeking connections (Yang & Chen, 2007). Piaget (1962) regards play as a behaviour whose goal is to obtain happiness. It is an unstructured behaviour that plays an assimilative role in cognitive development, promoting individual cognitive development. According to Piaget and the cognitive theory of play, toy forms are classified as symbolic play objects, fluid construction play materials, structured construction play materials, sensory-motor play objects, and learning toys for numbers and symbols. When parents and children play together through games and toys, the relationship between children's adaptive behaviour, growth performance, and problem-solving abilities in different situations is explored.

RESEARCH METHODS

1. Subjects and survey duration

   The research methods adopted include the questionnaire survey method and statistical methods. They were applied to explore the forms, time, and attachment relationships of parent-child co-play. Therefore, the

subjects for the questionnaire survey were set to parents with at least a preschool child aged 2 to 6.

- Subjects: Dual-income families with parents of children aged 2–6 years old.
- Number of questionnaires issued: 30.
- Duration of survey: December 2023.
- Place and method of survey: online.

2. Experimental variable

- Independent variables: According to American Time Use Survey, time is divided into half hour. In this research, parents' off-duty companionship time for children is studied, therefore, the research is focused on: (1) the time period from 16:00–16:30 to 24:00, and each half hour is taken as one unit; (2) form of toys, based on the 6 categories of toys defined by Piaget's theory: Symbolic play materials (Dolls, puppets, and models), Fluid construction toys (Clay), Structural construction toys (Building blocks), Sensory-motor playthings (Slide), and Learning toys for numbers and symbols (Number cards and letter cards) and the most common one: picture/illustration books.
- Dependent variables: Measurement of Problem-Solving Ability: Adapting the questionnaire from Lin (1995) and Gülsüm Düşek & Aynur Bütün Ayhan (2014), focusing on assessing problem-solving abilities in preschool children. The questionnaire, titled "Children's Problem-Solving Ability Scale," consists of 32 items, numbered from 1 to 32.

3. Research tool

Subjective perception scale, Likert Scale with a five-point measurement scale ("Strongly Agree, Agree, Unsure, Disagree, Strongly Disagree"). Respondents indicate their subjective feelings based on past experiences and observations of their child's problem-solving skills and relationships with people and things.

4. Statistical analyses

1. Descriptive Statistics
2. One-way ANOVA:

- Whether the form of parent-child play would influence child's problem-solving skills.
- Whether parenting time would influence child's problem-solving skills.

EXPERIMENTAL RESULTS

Descriptive Statistics

The average educational background is mainly from a university or a university of science and technology, while the household income averages between NT$60,000 and NT$80,000. About 75% of females is primary caregivers, with 19 children aged 2 to 4 years old and 11 children aged 2 to 6 years old.

Table 1. Demographic statistics.

Count	No.	Min.	Max.	Avg.	S.D.
Gender of subject	30	1	2	1.83	.379
Gender of child	30	1	2	1.37	.490
Age of child	30	1	2	1.37	.490
Education background	30	3	5	4.33	.606
Average of household income	30	2	6	4.57	.817

ANOVA Results

According to the results from the test of homogeneity ($P > 0.05$) and ANOVA, the significant items ($P < 0.05$) are listed in Table 2 and 3.

Table 2. Test results of the influences of the parent-child co-play forms on the intensity of children's problem-solving skills.

Independent variables	Dependent variables	Sum of squares	Degree of freedom	Mean squares	F	Significance
Symbolic play materials	My child has good peer relationships	11.279	4	2.820	3.509	.021
Fluid construction toys	My child has excellent interpersonal skills	11.743	4	2.936	2.989	.038
	Once my child starts doing something, they always finish it without giving up	10.052	4	2.513	3.601	.019
	My child can come up with creative and effective ways to solve problems	4.576	4	1.144	2.834	.046
Sensory-motor playthings	My child demonstrates a strong vocabulary comprehension ability	12.330	4	3.083	13.920	<.001
	When reading, my child pays attention to the main characters of the story and meaningful information	13.281	4	3.320	5.349	.003
Numbers and symbols	My child is interested in learning	5.267	4	1.317	3.105	.033
	My child can identify problems in their everyday life	7.283	4	1.821	8.010	<.001
	My child is more motivated to do something when it is challenging	3.917	4	.979	2.756	.050
Picture/ illustration books	My child demonstrates a strong vocabulary comprehension ability	5.059	3	1.686	3.423	.032
	My child is interested in learning	4.922	3	1.641	3.897	.020
	My child tends to ask questions when encountering problems	4.674	3	1.558	4.407	.012

Table 3. Test result shows that parenting time will affect child's problem-solving skills.

Independent variables	Dependent variables	Sum of squares	Degree of freedom	Mean squares	F	Significance
17:00–17:30	My child can identify problems in their everyday life	1.932	1	1.932	4.903	.035
	My child can make quick decisions to solve problems if they have access to resources	2.760	1	2.760	4.244	.049
17:30–18:00	My child has excellent interpersonal skills	5.633	1	5.633	5.143	.031
	My child demonstrates excellent language abilities	4.033	1	4.033	5.465	.027
	My child is interested in learning	2.904	1	2.904	6.272	.018
	My child can make quick decisions to solve problems if they have access to resources	3.115	1	3.115	4.885	.035
	My child has a clear approach to problem-solving	5.633	1	5.633	9.100	.005
18:00–18:30	My child has excellent interpersonal skills	6.982	1	6.982	6.668	.015
19:00–19:30	My child has excellent interpersonal skills	5.157	1	5.157	4.637	.040
20:00–20:30	My child handles frustration well	6.017	1	6.017	7.341	.011
	When my child senses a problem, they try to understand its cause	4.267	1	4.267	4.760	.038
	My child can respond promptly when encountering problems	3.750	1	3.750	4.895	.035
20:30–21:00	My child has good peer relationships	5.502	1	5.502	5.957	.021
	My child engages in continuous reflection and analysis of their experiences to solve problems effectively	3.259	1	3.259	6.068	.020
	When my child senses a problem, they try to understand its cause	8.760	1	8.760	11.904	.002
	My child can reflect on failures and devise new problem-solving strategies	3.813	1	3.813	5.653	.024
21:00–21:30	My child demonstrates a strong vocabulary comprehension ability	3.401	1	3.401	6.582	.016
	My child has excellent interpersonal skills	6.982	1	6.982	6.668	.015
	When reading, my child pays attention to the main characters of the story and meaningful information	5.345	1	5.345	6.381	.017
	My child has good peer relationships	9.503	1	9.503	12.170	.002

(Continued)

Table 3. Continued

Independent variables	Dependent variables	Sum of squares	Degree of freedom	Mean squares	F	Significance
	My child engages in continuous reflection and analysis of their thoughts and experiences to solve problems effectively	3.607	1	3.607	6.873	.014
	My child can quickly learn from past experiences to prevent repeating the same mistakes	4.261	1	4.261	5.618	.025
	My child can reflect on failures and devise new problem-solving strategies	3.007	1	3.007	4.275	.048
21:30–22:00	My child demonstrates a strong vocabulary comprehension ability	3.227	1	3.227	6.171	.019
	My child has excellent interpersonal skills	4.860	1	4.860	4.328	.047
	When reading, my child pays attention to the main characters of the story and meaningful information	3.840	1	3.840	4.308	.047
	My child has good peer relationships	6.407	1	6.407	7.187	.012
	My child can identify the crucial factors within complex problems when faced with them	2.940	1	2.940	4.635	.040
	My child engages in continuous reflection and analysis of their thoughts and experiences to solve problems effectively	2.940	1	2.940	5.359	.028
	My child can reflect on failures and devise new problem-solving strategies	4.860	1	4.860	7.628	.010
22:00–22:30	My child has good peer relationships	4.167	1	4.167	4.289	.048
	When facing complex problems, my child can identify the most important factors in the problem	2.940	1	2.940	4.635	.040
	My child handles frustration well	5.607	1	5.607	6.720	.015
	My child can reflect on failures and devise new problem-solving strategies	2.940	1	2.940	4.166	.051

CONCLUSION

Female Caregivers

In the child development process, mothers primarily serve as caregivers. According to Table 1: Demographic statistics, there is a notable prevalence of highly educated working women serving as primary caregivers for children on a daily basis.

Relationship Between Toy Types and Problem-Solving Skills

It is undeniable that children often have dolls, puppets, and models (symbolic play materials) as companions, which helps them build better relationships with their peers. Learning toys for numbers and symbols (number cards and letter cards) help children develop logical thinking. They can easily identify problems, become interested in learning, overcome fear of facing problems, and accept challenging tasks. Additionally, the results show that parents and children studying picture or illustration books can develop children's language capabilities and foster interest in learning. Children are also more willing to ask questions when they encounter problems.

Rubin, Fein & Vandenberg (1983) stated that children can experiment with various new behaviours and playstyles, which can later assist them in real-life situations that require problem-solving. This aligns with the findings that fluid construction toys and playing with clay can help develop children's problem-solving abilities in creative ways and enhance their interpersonal skills.

Interestingly, sensory-motor playthings have a significant impact on language development in children. Furthermore, during reading, they can focus on important roles and content, which is a part that the author had not previously discovered. However, in the past, Lue (2002) mentioned that parents participating in children's games together, cooperating, and teaching game rules can cultivate children's problem-solving abilities. In the future, it is worthwhile to further explore which sensory action games are helpful for children's growth and problem-solving skills.

Relationship Between Parenting Time and Problem-Solving Skills

The companionship time falls between 17:00–18:00, the time when parents pick up their child after school, and the results show that 21:00–22:00, bedtime significantly impacts children's problem-solving skills. This contributes to the child's ability to 'analyse problems.' When facing complex issues, the child can identify the most critical factors. When encountering a problem, the child will first understand the reasons behind it. If the child feels stuck, they will re-examine the situation and conditions related to the problem, finding alternative solutions. During this period of time, parent-child interaction can strongly develop children's language capabilities and good relationships with their peers. The evidence shows that children have strong vocabulary comprehension ability and are able to pay attention to the main characters of the story and meaningful information when reading, as well as building trust to develop excellent interpersonal skills.

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