

Explore The Development and Innovative Design of Children's Toys

Junxin Qiu *

Fuzhou No.3 High School, Fujian, China

* Corresponding Author Email: linmengting@bjbtyykj.com

Abstract. Toddlers are experiencing dramatic changes including their cognitive ability and motor ability. Thus, the way they play with toys proceeds to another stage. By studying articles from different sources, conclusions that help clarify basic ideas on toys chosen for kids are made. The study discusses toddlers' development from various perspectives including physical development, cognitive development, and affective development. Based on their growth, further claims on the social demand of kids are presented. Meanwhile, the article shows values that various features of toys attach. Colors, sounds, materials, and safety are all chief factors in toy design, and their effects are discussed. Additionally, as technology is widely implemented in the toy industry, a critical review is to be made. Focused on its power and the results it might bring, its potential is discussed. The study has found that social needs including parental interaction for toddlers are becoming increasingly important. To meet their requirement, toys that foster interaction between parents and kids should be paid more attention. Toddlers also experience changes in the physical area. Sounds can intrigue their interest to play and materials with different texture can lead to more exploration which in turn facilitate their growth in both physical and cognitive area. At the same time, digital-era toys are not as beneficial as they are claimed. Interactions between toys and kids as well as between kids and parents might be disturbed by digital-era toys. Nevertheless, technology does seem promising in the field of toys for people with special needs.

Keywords: Toddler; development of kids; technology; toys.

1. Introduction

In recent years, more types of toys have occurred including electronic toys that get increasingly fancy and sophisticated. However, not all toys help with kids' growth. Thus, choices of toys are of great importance. A study that clarifies toys' traits and the mechanism behind them will help people to tell proper toys from others. The study aims to find out the relationship between toys and toddlers' development and the effect of different features of toys. Additionally, the study discusses the impact of new-era toys such as digital games and toys that feature electronic functions. The article is based on solid studies concerning toddler development relating physical, affective, and cognitive aspects of children's development during toddler ages [1]. Further discussion on children's social needs is made in order to find out the types of plays required by toddlers. Studies of the effect of different features of toys are then shown to support the claims of what children need. Finally, a comprehensive review of the Impact of digital-era toys is presented with a comparison to traditional toys.

2. Toddler Development

Toddlers refer to kids aged 1 to 3. At this stage, kids undergo relevant changes in a variety of aspects such as improvement in physical area, increasing cognitive capability, and so on.

For the development of the physical area, the fast-growing rate during infancy declined. On average, kids obtain 5 lbs each year and get 2.5 inches taller [1]. Body proportions change as well. Meanwhile, gross motor skills develop rapidly during the toddler years. Balance and coordination become more developed and complex gross motor patterns improve as well. They start to master gross motor skills. For instance, they can walk with more balance, run faster, climb more easily, and so on. Fine motor skills develop as children have more attempts at reaching, grasping, and

manipulating small gadgets. For example, they are able to build a tower with several blocks and draw with crayons spontaneously on paper.

Affective development is fostered by more advanced motor skills that the kids find that they can move in a rather easy way. With these skills, early attempts at exploring and finding out boundaries and limits appear. For example, they start to reject food delivered by their parents unless they feed themselves. The emotional range of toddlers expands, and they may exhibit emotions like excitement, anger, joy, and more. They start learning to express their emotions through language and behavior. They show preliminary independence and autonomy as the temper tantrum occurs, which is the typical representation of kids' early attempts to seek independence in a specific way [1]. Toddlers form a preference for doing things in their own way. If not, they might start to rebel in ways such as crying or throwing themselves to the ground.

Though toddlers start to get independent and seek autonomy, attachment between parents and toddlers still manifests in important ways. A tight bond is important in children's emotional development despite their preliminary pursuit for autonomy and independence. They still rely on parental ties for confidence to explore. For instance, during the exploration of the outside environment, they might get attracted and wander into crowds or bushes. However, once they notice the absence of their caregiver, they will get overwhelmed and, quite often, start to cry. It is not often that toddler do not seek their caregiver under pressure such as when taking exams or being in an unpleasant environment. If so, there might be a disorder of attachment. Toddlers who have this kind of disorder is likely to show negative attitude in exploration and they may be in separation problem. What's more, problems of distrusting their caregivers might emerge.

In the aspect of cognitive development, toddlers no longer rely on sensorimotor thinking. They rather use a new way which is called pre-operational thinking [2]. They start to develop symbolic thinking instead of sensorimotor way (learning the world primarily through touching, looking, and listening). They are now able to form images inside their brain and deal with problems by creating experiments inside their brain. This ability manifests in the ways they play. For example, they simply use a cube to present a car or pieces of wood to act as a train. They also imitate past events by using symbols. For example, they start to use simple tools to act like cooking just like their parents do. Additionally, toddlers develop complete object permanence, allowing them to find objects that continue to exist even when they're not in sight such as dolls covered by a blanket. Nevertheless, the cognitive capability is still not fully developed at this age. The mission they can process is limited as is pointed out in Piaget's conservation experiment: When two containers have an equal volume of water with color, kids will always think that the short and fat one has less water as they claim that high thin one has more because it looks bigger to them [3].

Since language is a manifestation of pre-operational skills. Predictably, toddlers' language skills also improve. Substantial improvements can be seen from different aspects. The vocabulary they master grows at an extraordinary pace and their vocabulary skyrockets to about 500 words when they are 3 years old. They are better at expressing themselves and also processing the message from others in an advanced way. About '75% of speech is understandable to strangers [4]. Meanwhile, they can speak with complete sentences and also learn different ways of speaking. For example, they try to change their pace of speaking, intonation, usage of words, and so on [5].

3. Social Needs for Toddlers

As kids get older, they need more social interaction, and the great importance of social activities is shown. The connection between parents and kids is important as parents' emotions can affect toddlers' emotions. Furthermore, Maternal support plays an important role in toddlers' development. Social support and the ability to answer children's responses are the major mediators of kids' social development in all families, including those with disorders or uncertainties (maternal effect). They spend most of their time with toys and parents. Research shows that when kids are 17 months old, they spend one-third of the time with their mothers and half of the time dealing with objects including

playing with them and observing them [1]. Time spent with toys is obviously a part of toddlers' social demands. They learn to negotiate, cooperate, and engage in imaginative scenarios, which are all critical for building social skills through communal play. Meanwhile, solitary play has its own value of potentially encouraging divergent thinking [2].

4. Effect of Different Features of Toys

Gottfried argues that stimuli with collative properties are more appealing to children in infancy as well as early childhood than those with familiar stimuli. These attractive properties have been recognized as novelty, complexity, and incongruity [3]. It has also been discovered kids actually prefer novel toys to conventional toys [4]. Complexity is also beloved by children [6]. Kids are in the stage of exploring and have mastered better motor skills. It is also shown that different properties of toys and various kinds of stimuli can intrigue kids' interest. Here are some features of toys that either encourage play or benefit children's development.

4.1. Color

Color is an important feature of toys. Specific color patterns could draw attention from children and thus it has become a good marketing strategy. Furthermore, colors can stimulate visual development and cognitive recognition. Different colors can also convey emotions and stimulate creativity during imaginative play. For example, an experiment conducted by Xia et al., 2016 shows that red promotes performance on an uncomplicated detail-oriented task, according to the study while blue shows evidence of promoting performance on creative activities that contain both challenging and simple elements. Blue also has positive effects on complicated detail-oriented activities. Additionally, the type and intricacy of the task have a joint effect on color's influence on cognitive function [7]. Additionally, different patterns of colors can impact learners' retention. However, the stereotype of colors that girls often prefer pink and boys like some else is proven to be false. In fact, reddish colors are generally preferred, and the direction of influence could be the opposite. Girls may learn to prefer pink because the major color of their toys is pink, and boys may learn to expel pink because few toys their own character a pink color.

4.2. Materials

Materials also serve a main role in toy design. Toys with different textures provide tactile stimulation, helping to develop a child's sense of touch and different materials can set up different play settings and thus might enhance social-cognitive development. For example, by making toys out of fabrics, Kaori understands the permanence of toys. The teacher hides a toy doll under a desk and suddenly reveals the doll. Kaori is excited about the return of the toy and thus playing with the doll leads to his understanding of toy permanence [8]. He is able to acknowledge the things that cannot be seen. Thus, it fosters kids' awareness to learn and explore. Meanwhile, for different kinds of play, there are different preferences for materials. A study has shown that a vast majority of all materials were used in an isolated fashion at one time or another [8]. while for parallel play some materials that have been used for the former kind of play are barely applied. Thus, the material selected for the toys might serve as an indicator of its type. For example, wood toys often occur to be building and construction toys while plush toys are often made for sensory play.

4.3. Sounds

Since kids love making noise, sound is considered as another major feature of toys. Sounds can draw attention from kids as well as add an element of surprise and excitement to play.

Playing with sound also provides children with opportunities to find out the mechanism of objects and find the connection between their actions and the outcomes. This kind of play is beneficial for their development of self-awareness, and it also helps them with their control over their environment. For example, a simple noise-making toy that produces interesting sounds every time it is shaken by

the teacher makes Mario happy. He smiles and starts to act like his teacher. Every time he shakes the bottle it produces more sounds which in turn fosters this kind of motion [8].

4.4. Interactions

Interaction between parents and kids around toys has important values. Most importantly, it fosters joint attention. Joint attention enables kids to share their experiences with their partners while they are engaging in the same activity or playing with the same toys. This kind of interaction is likely to improve their capability of obtaining knowledge through social activities and thus the interaction between both toys and players is thought to be valuable [9].

4.5. Safety

Despite all the attractive features, safety concerns should not be neglected. Toys should not be too small as kids might swallow them accidentally and get choked. Additionally, there is a major concern about plastic toys which might be toxic. Generally speaking, the risk of children being exposed to chemicals is considered particularly high. This is because their fast metabolic rate, relatively broad surface, and fast-growing organs and different body parts lead to higher danger when exposed to chemicals [10]. In addition, whether toys are safe or not depends on the way toys are used and how the supervision is needed for play. The safety standard should thus include a wide range of considerations. Hence the materials chosen, sizes of toys, and how the toys work should be pondered through designing.

5. Impact of Digital-Era Toys

In the 21st century, the definition of play does not change. However, the way to enjoy games and toys has become different. In the 21st century, the definition of a game hasn't changed. However, the way to enjoy games and toys has become different. The difference is caused by sophistication in the technology area. The development of electronic, stimulating noise, digital software and apps that aim at kids, and light toys are thought to be the core part of the change. This leads to some parents' misbelief that those elements are beneficial to their children's development. However, this kind of opinion lacks solid evidence. Instead, it comes with the potential of harming caregiver-child interactions. There are advantages of new era play but potential threats emerge as well. Indeed, a comprehensive review of the influence of new toys should be done.

New toys with new features offer a more sensory experience as a variety of effects can be achieved by the newest technologies. Furthermore, technologies are now playing important roles in serving kids with special needs. It has been an essential part of supporting the different functions of toys. With its power, it is involved in many designs that tend to address developmental interventions. With more guidance from researchers, the potential of new technologies plus toys for special needs is unlimited.

Digital toys are purposed to allow children to play without their parents' company. While this relieves parents from giving them more time for work or other affairs, solitary play has several drawbacks.

Data support that playing with toys with caregivers rather than playing alone is the major factor that affects kids' development [11]. Interaction that is formed through play cannot be simply replaced by electronic devices as well as the flashy features of electronic toys. Parental care should not be neglected as a part of the play.

Meanwhile, playing with digital games could substantially cut down children's time spent on traditional toys. A 2013 study shows that about 40% of US children under 2 years old have contacted mobile electronic media devices and the percentage upsurges to 80% when it comes to kids 2 to 4 years old. This data is two times higher than data in 2011. Plus, more data in 2015 shows that only a few kids ever use mobile devices above one year old [11]. For toddlers, ways to explore with hands

and manipulate toys that activate the brain cortex associated with spatial and math learning are of great importance and might have a great influence on their further development.

Additionally, digital toys are very seductive. They are advertised in ways that raise adults' desire to choose toys that are beneficial to children's learning and development. Typical features such as movements, exaggerated sounds, and fancy lights are used to catch parents' and kids' attention. Such ways of marketing not only result in parents' misbelief about these toys but also harm children's growth potentially once kids are surrounded by these toys. Perhaps, parents might not benefit from the work of technology in the optimistic way that it has promised. It might not benefit children's well-being and further achievements in the future. Quite the opposite, the kids might face lights and sounds that seemingly substitute their parents' faces and sounds which hinders parental interaction and may bring problems relating to creativity and imagination, active play, and learning.

6. Conclusion

Toddler age is the time when kids are experiencing dramatic changes in cognitive abilities, physical capabilities, and affective demands. They can do more movements and form a better sense of independence but still rely on their parents. Hence, social requirements such as interaction with parents through playing toys cannot be ignored.

Features including colors, sounds, materials, and safety are evaluated. Each of these traits can influence children's senses of the world as well as the way they think and feel. They might also help intrigue children's motif of exploring and thinking. Meanwhile, safety concerns relating to materials and designs are revealed. The introduction of new technologies and digital toys do bring some benefits including facilitating the growth of toys for kids with special needs. However, seductiveness has a huge potential to disrupt kids' normal interaction with parents as well as traditional toys. Meanwhile, those toys are not proven to be as helpful and educational as they are advertised. Parents should ponder before choosing toys for kids.

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