

Research and Design of Portable Tableware for Children

Sina Cui

School of Art and Design, Wuhan Textile University, Wuhan, China

Abstract: With the development of economic level, people's life is more and more attention to the quality of life, in daily necessities also more attention than before. Many families have only one child, so parents are investing more and more in children's products, and children's tableware has gradually come into people's vision. The main research content of this paper is to study and design a portable children's tableware set, in order to better solve the problem of preschool children eating out, at the same time to help children eat better, have a good eating experience. In this paper, the methods of investigation analysis, functional thinking of products, man-machine analysis of products and emotional analysis of children's psychology are used to study and design the product series of portable children's tableware.

Keywords: Portability; Children's Tableware; Funny; Detachable Design; Usability Design.

1. The Present Situation of Children's Tableware

In today's society, many families are the only child, children's needs and feelings are paid more and more attention, therefore, the design of children's products should have more in-depth research. Children are the future of our country, so their growth has a bearing on the fate and prosperity of our country. Childhood is an important period that affects a person's character. "Lucky people are cured by childhood all their life", which shows that childhood is very important for a person. A good children's product, even may affect the child's life [1].

Children's tableware is an important type of children's product design. According to the survey, there are about 180 million preschool children in China; In urban areas alone, there are nearly 40 million children aged 0-6 years, and about 20 million new children are born each year. The introduction of the two-child policy in 2011, the two-child policy in 2013 and the universal two-child policy adopted at the Fifth Plenary Session of the 18th CPC Central Committee in 2015 have led to an increasing number of newborns each year. This is a very large number, this represents children's tableware, at least about 40 million audience (counting only urban children).

Preschool children are in the initial stage of growth and development, their intelligence, body, character in this stage to get rapid development, and tableware has become one of the important factors affecting their growth and development. A good tableware, can let the child fall in love with eating, when eating can feel fun. Children are willing to eat, willing to eat, on their growth and development is very huge. Many children because they do not want to eat, resulting in small growth, insufficient spirit, and even affect their intellectual development. Therefore, in view of our existing preschool children tableware design, I will carry on a more in-depth study, and strive to design a series of excellent children's tableware, to provide some healthy and convenient tableware for children.

On the design of children's tableware, European and American countries started to develop first. Due to the good economic development in Europe and America in the early

years, the designer has designed a series of children's tableware considering the dining needs of children.

2. Market Analysis of Children's Tableware

With the rapid development of China's economy in recent years, people's living standards are constantly improving, and the change of consumption concept makes people have higher requirements for material life. In this opportunity, children's products industry has also been rapid development. About 30 million babies are born in China every year, which is a very large number, and with the two-child policy being fully opened up, more and more babies are likely to be born each year in the future. The global market value of children's tableware reached 17.8 billion yuan in 2019 and is expected to grow to 25.5 billion yuan in 2026.

On August 20, 2021, the "three-child" policy was officially entered into law. Influenced by this policy, the number of newborns and the consumption power of the population will also increase, and the market demand for infant products in China will be on the rise. With the change of people's life concept and child-rearing concept, the new generation of post-90s parents pay more attention to child-rearing, and maternal and infant products will continue to be refined. At the same time, due to the steady increase of the national economic level and the increase of residents' income in recent years, the consumption level of baby products of Chinese families has continued to increase. According to the 2019 White Paper on the Consumption Insights of China's post-90s mothers, the average monthly expenditure of mothers and infants in 2019 was nearly 6,877 yuan, of which 57 percent were for babies and 43 percent were for mothers. In 38.8% of the families, maternal and infant consumption accounts for 31% ~ 50% of the total family expenditure, and in nearly 17.7% of the families, the monthly expenditure of maternal and infant consumption accounts for more than 50% of the family monthly expenditure [2]. In the future, with the continuous improvement of parenting attention and the continuous refinement of maternal and infant consumption categories, there is still room for further improvement of this proportion. Driven by factors such as the upgrading of consumption

structure and the comprehensive liberalization of the two-child policy, infant products are in increasing demand, accounting for a large proportion in the market demand.

3. The Design Method of Children's Portable Tableware

A good product design must have corresponding functionality. Product function can be divided into use function and aesthetic function. Using function refers to transforming designers' ideas into designed products through design, so as to meet people's material needs, mainly to reflect the value of designed products. Aesthetic function refers to the internal and external forms that the designed products can evoke people's aesthetic feeling and satisfy people's aesthetic needs. Judging whether a product has aesthetic function is mainly to see whether the product can arouse people's aesthetic feeling in the process of use. For the design of children's portable tableware set, the use function must meet the following points:

1. Easy to carry. This is the most basic and important function of children's portable tableware. This requires the design of products to make the material light, easy for children and parents to carry out.

2. It can assist children to eat. For example, young children are not able to eat with chopsticks flexibly, so we need to design the functions of children's chopsticks to help children eat.

3. It has insulation function. When children go out to eat, usually the food has been placed for several hours. In order to avoid eating cold food and affecting children's dining experience, children's lunch boxes are required to have thermal insulation function.

4. Convenient storage. The tableware carried outside should be convenient to store and not take up too much space. For example, tableware can be folded, detachable and assembled.

5. It can improve children's interest in dining. Many families are distressed for the baby to eat, children are naturally curious, will be interested in some interesting things, how to make tableware attract children's attention and interest, this is a need to focus on the problem [3].

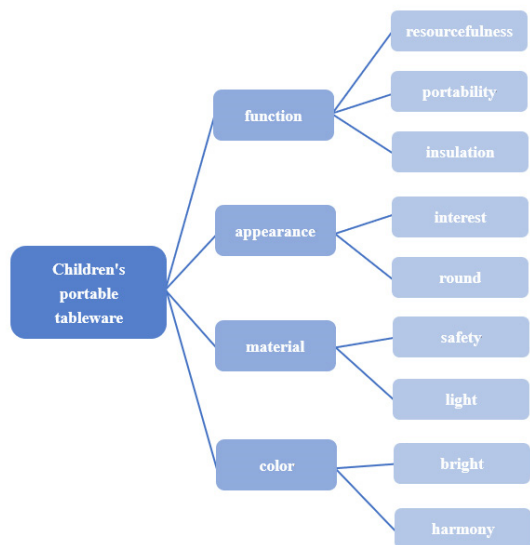


Figure 1. Children's portable tableware features

Children's portable tableware should also have certain

aesthetic functions when meeting the use function. Early childhood is an important stage to cultivate a person's aesthetic, so when designing children's tableware, we should reasonably use color collocation and a variety of interesting forms, to improve the beauty of the product, so that children get the feeling of beauty.

4. Portable Children's Tableware Design Practice

4.1. Preliminary Positioning of the Design

The design of children's tableware took into account the portability and functionality of tableware. At present, most parents of infants and toddlers are born in the 1990s, who have different and more diversified consumption concepts. More and more families have their own private cars, which makes many parents drive their children out on weekends and holidays. As a result, portable children's products have entered people's lives, and portable products have become increasingly indispensable. Infant portable tools are a new type of product developed with the rapid improvement of people's living standards. It refers to the tools used for carrying, nursing and rearing children from birth to three years old, such as baby baskets, backpacks, dining chairs and carts [4]. With about 30 million babies born every year, I am the most populous country in the world. With the implementation of the universal two-child policy in 2015, the number of newborns will gradually increase. And spending on children's products already accounts for about a third of total household spending, which is a very large amount. In the face of such a large market, it is necessary to design a good set of children's tableware.

Children's portable tableware design, not only need to consider its function, easy to carry, but also take into account the psychological needs of children, using feelings and so on. Portable children's tableware not only needs to be considered to meet the individual needs of people, but also needs to reflect the function of the product, with a certain use function. Portable children's tableware must be light material, can adjust the size of the product, length. Because to take into account the user - 3-6 years old preschool children's feelings, the product should be simple and beautiful, bright and lively colors, to meet the psychological characteristics of children. Modeling as far as possible to do novel, can attract children

4.2. Children's Tableware Design Concept

With the improvement of the quality of life, there are many new categories of cutlery for our daily use, and an important category is children's cutlery. 3-6 years old children are in an important transition stage from parents' feeding to independent eating, and a good children's tableware can provide children with a comfortable dining environment and good dining experience, which has a subtle effect on the growth of children. However, the quality of children's tableware in the market is uneven. Many products only pay attention to the novelty of printing patterns and shapes, while ignoring the functionality and safety of children's tableware. If the tableware design does not meet the needs of children, it will bring bad experience to children, and even harm the physical health of children. It may lead to children's psychological resistance to eating, affecting their growth and development. Therefore, the design of children's tableware must meet good functionality and safety.

Another concept I had in mind for this design was

portability. Portable daily necessities refer to "leaving the place of one's daily life for work or sightseeing". The environment is not fully equipped with the products or daily necessities used by people habitually, and due to the change of objective environment. In order to ensure the normal use of daily supplies and the normal progress of work, people must have the need to carry necessities of life. Nowadays, parents like to take their children on sightseeing trips, so portable children's tableware has been created to help people solve the problem of eating out, and is very environmentally friendly. Portable tableware generally includes chopsticks, spoons, forks and bowls. Considering the tableware must be easy to carry, the general portable chopsticks, spoons and forks are detachable or retractable, which takes up less space, and portable bowls generally have insulation characteristics, which can maintain the temperature of food. Considering that children need to learn the characteristics of chopsticks, children's portable chopsticks should pay attention to the function of guiding children to use chopsticks. Children's palms are small, so the size of children's sporks should be smaller than ordinary sporks. Children naturally like to grasp objects, so children's spork handle should be easy for children to hold. When designing the shape of children's portable tableware, we should not only consider the beauty of the appearance, but also connect with the familiar things of children, such as small animals, toys and so on, so as to attract children's interest. Compared with straight line items, children prefer curvilinear items, and curvilinear tableware is not easy to hurt children, so when designing children's tableware, we should add more curvilinear elements.

4.3. Selection of Tableware Materials

Now there are a lot of children's tableware on the market, it is a full of beautiful things, mixed. Parents of children's tableware is the most concerned about the use of children's tableware safety issues, children's tableware materials on the market at present, there are many kinds of basic can be divided into: ceramic class, wood class, stainless steel class, plastic class, plant fiber class. When choosing cutlery for children, the first thing to consider is that it is safe and non-toxic. Tableware materials cannot contain harmful substances, will not emit odor, followed by corrosion resistance, acid and alkali resistance, high temperature resistance, at the same time to have environmental protection, it is best to use environmental protection materials.[5]

4.4. Complete the Design

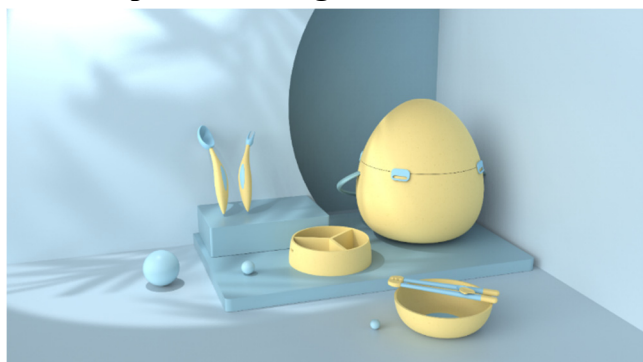


Figure 2. Product renderings

This set of children's portable tableware, roughly divided into three parts: children's portable fun lunch box, children's portable learning chopsticks, children's portable spork. This

design follows the concept of portability, comfort and fun, is committed to let preschool children enjoy the pleasure of eating, and help children learn to use chopsticks.

Children's portable fun lunch box: The appearance of this lunch box adopts the shape of an "egg", which can be opened from the middle, and the upper and lower parts are connected by a buckle. After opening, there are three storage areas on the upper layer, which can store portable children's sporks and portable children's chopsticks. There is a cover at the bottom to prevent tableware from falling out. The lower layer can be placed a layer of food plate and a layer of dinner plate, and the two layers of dinner plate can be taken out and used during the meal. The lower part of the box where food is placed is designed with insulation inner liner, the outermost layer is plastic shell, and the middle sandwich is made of 316 stainless steel and hollow insulation layer. The shell of the upper part of the box where the cutlery is stored is plastic, which can reduce the weight of the whole box and make it easy for children to carry.

Portable learning chopsticks for children: These chopsticks can be split into two parts for easy storage in the accompanying meal box. One of the chopsticks has a thumb holder so that the child can place his thumb without feeling constrained, and the other has a small groove in the middle for the child to place his middle finger. With the fingers in the right place, the child can better grasp the chopsticks and learn to eat with them. There are two small holes at the top of the chopstick, which can be threaded to prevent the loss of the other chopstick. I widened it and designed it into two small grab-clip parts, which are convenient for children to grab food. There are wavy lines in the middle to prevent children from grabbing food.

Children's portable spork combination: This portable spork combination takes full account of children's palm size and children's grasping nature. The spork has a rounded handle and a slightly curved front section connecting with the head, which is convenient for children to take food. The heads of forks and spoons can be detachable, and the length of the forks and spoons can be shortened to accommodate children's portable meal boxes. Spoon head and fork head curve smooth, avoid damage to children's tender lips, very safe.

5. Conclusion

Nowadays, the development prospect of children's tableware is very considerable, the market demand is also increasing, and the continuous breakthrough of a variety of new materials and technology also brings more possibilities for the development of children's tableware. When designing children's tableware, we should consider it from the perspective of children as far as possible, so as to combine functionality, fun and decoration, so as to better meet the needs of children and help them grow up healthily

References

- [1] Debra Levin Gelman. Children's Product Design in the Digital Age. Hubei Province: Huazhong University of Science and Technology Press, 2017.
- [2] Denise Boyd, Helen Bee. Developmental Psychology: Children's Growth. China Machine Press, 2011.
- [3] Cheng Weijie. Design and Research of Humanized Portable Daily Necessities. (MS, Hubei University of Technology, China, 2017).

- [4] Tian Ye. Research and Development Content and Program of Man-machine System for Baby Portable Tools. Industrial installation, Vol.6 (2019), p.64 – 65.
- [5] Li Jing, Huang Guixiang, Sun Zhiyu, et al. Analysis of Influencing Factors and Design of Tableware Selection. Drama Home, Vol.9(2020).