An Alternative to the "screen baby sitter" for preschoolers

Soo Min Seo

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An Alternative to the "Screen Baby Sitter" For Preschoolers

Soo Min Seo
Aug. 2007
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Chapter 1. Problem statement

Background

Contemporary screen media is regarded as a babysitting tool in many typical American families. Parents use television to manage their busy lives, enable them to rest, and facilitate family routines such as eating or sleeping. The image of children sitting in front of a living room television is commonly recognized. "...26% of U.S. children watch four or more hours and 67% watch two or more hours per day" (Center for Disease Control and Prevention, 2001.)

Moreover, many parents allow children to have personal television sets in their bedrooms. According to research by the Kaiser Family Foundation in 2007, approximately one-third of children have their own bedroom televisions, and 55% of parents feel it is better for each family member to have their own television set. It seems that recent television-
watching behaviors not only cause problems for the children themselves but also encourage isolation of family members; children can continue watching their favorite shows even when not at home! This ability can be attributed to the development and prevalence of portable DVD players that not only work well but are also very affordable. Several specialists promote the use of portable DVD players outside the home, and many parents agree DVD players are especially important during travel, as the screen will hold a child's attention and can facilitate a peaceful journey, free of crying or arguing. Additionally, children are more open to the screen than previously: viewing time that was traditionally limited by location is no longer reduced accordingly. Isolation between parents and children is increasing as more preschoolers have their own televisions or compact-sized screens.

(www.businessweek.com, 2006)

Another serious situation is the overuse of screen media; it has become the rule, rather than the exception, for younger audiences. One of the many reasons for this shift is the multitude of DVDs marketed toward children today. DVD producers constantly reintroduce popular movies and television shows, appealing to the family's nostalgic memories of these shows' initial releases. The continuing popularity of such shows leads parents to believe that the familiar equals the norm, and that by continuing to purchase or watch these shows over an extended period of time, they are doing what other 'normal' parents do and are engaging in a 'typical' family lifestyle. Another purchase incentive is the continuous availability: by purchasing new versions or episodes of older DVD packages, children can watch their favorite shows any time they wish and as often as they wish.

(www.npr.org, National Public Radio, 2007)

Another contributing factor to the sense of comfort brought by DVDs is the availability of educational series. Parents feel justified in allowing
their children to watch instructional programming, and will generally believe they have made a better choice in opting for an educational program over a purely entertaining one. As a result, parents have fewer qualms about allowing their children to watch this type of television under less supervision and with fewer time and location restrictions. A 2006 Gallup poll by Parents magazine showed that many parents feel screen media simplifies their lives. (Parents, 2007, 1)

**Risks of television overuse:**

Extended television viewing has been shown to increase the risk of poor physical and/or cognitive development. Many organizations report that long-term television watching results in children's becoming overweight, lacking developmentally, and experiencing less family interaction. (Singer, Dorothy G, 1980)

1. **Risks to physical development**

   Physical activities such as running, jumping, hopping, skipping or climbing are developmentally significant for children at the preschool level. Many parenting experts warn about the connection between childhood obesity and television watching. One experts comments that “Many kids spend 6 hours a day sitting in front of a screen, and as little as 30 minutes getting exercise. No wonder they are getting fat and developing type 2 diabetes and other adult diseases.” (Parents, 2006, 9) The snacks children are fed while watching television also have health ramifications.

2. **Risks to cognitive development**

   Children, especially those of preschool age who are undergoing
essential cognitive development, are at risk from watching television. "From birth to age 6, children rapidly develop foundational capabilities on which subsequent development builds. In addition to their remarkable linguistic and cognitive gains, they exhibit dramatic progress in their emotional, social, regulatory, and moral capacities. All of these critical dimensions of early development are intertwined, and each requires focused attention." (Kaiser Family Foundation Report, 1999) Undermining these needs are the commercials telling parents that educational DVD packages are better tools for learning than direct interpersonal interaction. However, even educational shows such as Sesame Street can risk the integrity of childhood development, even if only by commandeering the time that could otherwise be used for social development. Clearly, leaving children alone in front of the television is not the most ideal way to 'babysit' them; in the face of increasing research that television viewing harms children's development, parents need to reevaluate their attitudes toward babysitting. Both children and parents are missing out on essential family interaction when children spend time in front of the TV. Children typically watch television alone, and miss out on the strong parental and familial relationships built when talking or playing as a family.

**Parental use of screen media**

Many parents explain their allowing their children to watch television as catering to the children's desires; that the problem is simply that their children want to watch television more than their parents want them to. However, research has shown that "61% of babies aged 1 year or younger watch screen media (televisions, videos, and computers) in a typical day," (Archives of Pediatric and Adolescent Medicine, 2004) "43% of children under 2 years old watch TV every day and nearly one in five (18%) watch
videos or DVDs every day." (Mark Glaser, New Media Expert. 2006) Many parents are guiding their children to watch screen media when they could be taking the responsibility for building better viewing habits in their children. Children who spent a great deal of time watching television as babies or while growing up tend to continue this behavior into adulthood.

Preschool-aged children are old enough to be able to voice their opinions clearly; however, their use of screen media is still highly dependent on their parents' preferences. One reason for this occurrence is the ease of operability of media equipment: living room systems, including televisions, DVD players, and audio systems, are generally too difficult for children aged 4-6 to operate. Thus many preschoolers simply ask their parents to turn on the television and end up watching anything the parent chooses to put on. Children may also end up viewing the same show repeatedly, and can be found watching the show even when they are not trying to pay attention to the TV. (Parents, 2006, 8)

Family rules for television watching are a good way for parents to teach their children good attitudes toward screen media. Rules also benefit the parents: setting schedules or time restrictions on television viewing can help when children are pestering their parents to allow more TV time. Unfortunately, it can be difficult for parents to keep a set schedule for television watching. Parents are not always available to monitor the children's adherence to the schedule.

**Two scenarios in which television is used to babysit children:**

**Unavoidable:**

Because there are valid reasons for using electronic media to babysit one's children, it cannot be said that parents should stop using the
television altogether. Parents may need to concentrate on work or other important business, such as official phone calls. In such cases, very few activities can compare to watching television in the degree to which it occupies children's minds quickly and easily. Here, parents are relying on the TV to provide for their children's unobtrusiveness and relative invisibility to work efficiently and keep the children safely occupied. Few can deny this scenario is extremely common in parenting today. In this case, the television fits nicely into family life because of its ability to facilitate efficiency. (www.parents.com, 2005)

Avoidable:

Unfortunately, preschoolers also spend a great deal of time watching television when that time could be better spent doing a different activity. This phenomenon generally occurs when parents allow their children to watch television or play near the TV set when they have no real reason to be watching television. In these situations, parents could just as easily play with their children, but choose not to. This scenario can frequently be attributed to laziness on behalf of the parents. Often, even if the parents remain present while the children play, they only watch and do not participate. Tragically, one of the reasons they decline to participate may be that they simply do not know how to play with their children. Here, the problem appears to be a lack of knowledge about parenting, and is thus avoidable.

Parents themselves are the preferred babysitting option for their children. Toys and/or other people should only supplement direct parental care, and 'electronic babysitters', such as screen media, are a distant second choice. If parents find themselves with free time in their schedule, they should make communicational activities with their children a priority, instead
of leaving their children by themselves in front of the television. Parents who surrender to laziness or fatigue are condemning their children to a lifetime of suffering the aftereffects of television overuse.

The Kaiser Family Foundation, 2007

Fig. 1-2 Amount of children who own their own television

Fig. 1-3 The common reasons parents give children their own televisions

(Multiple choice)
Problem statement

The problem of excessive television watching in children is commonly regarded as a contemporary social problem. This perception is fueled by the fact that this problem is generally addressed primarily by cultural sociologic specialists. However, as an Industrial Designer, I believe design can positively impact people's attitudes or patterns of behavior with regard to this issue. Design can provide a different solution from the current academic ones if the risks associated with the overuse of screen media are adequately addressed via these new attitudes and behaviors.

In my thesis, pinpointing key moments in the problem situation is the beginning of the design process. The aforementioned 'avoidable' cases present the most important opportunities for problem solving. This thesis aims to create a solution for these 'avoidable' cases. My goal is to reduce the 'avoidable time' itself or to encourage different, more positive behaviors for this time period. I endeavor through my solution to prevent the problem of screen media overuse altogether.

The fact that "parents and children watch television together for almost half of the total watching time" (Jerry Johnson, Columbia University College of Physicians and Surgeons, 2006) presents another key aspect of the problem: that parents choose electronic means of babysitting even while they are spending time with their children. As Parents magazine points out, adults do approach parenting seriously, and are aware of the risks of too much television viewing. This thesis considers such situations, where parents are aware they should be engaging in more 'real' activities with their children. This thesis leads parents to join in their children's activities, rather than just occupying the same room.
My thesis addresses the problem of parents who are familiar with quality parenting but, because of laziness or unfamiliarity with methods of children’s play, use television as a babysitter when they could otherwise be engaging with their children. Following are specific target situations:

**Specific avoidable scenarios**

These scenarios include “times when parents...”:

1. choose television as a living-room-babysitter, then feel bad about abandoning their children;
2. want to rest on the couch, but feel uncomfortable because they know they could be playing with their children;
3. want to play with their children without physical exertion or special preparation;
4. are ready to play with their children, but don’t have enough time.

**Thesis proposal**

The goal of this thesis is to isolate the problems in the aforementioned situations and to determine a design-based solution. The mission of the final product is to change the target user’s attitude or life pattern in an unforced manner. Ideally, parents will develop a new, more positive attitude toward parenting and children will prefer playtime to television watching, thus becoming more available to their parents.
**Initial concepts**

At the commencement of the product conceptualization and ideation, I had many initial images of problem solutions. Though they represented certain product types purely as early ideas, each thought was developed into a resulting solution.

---

**Warning parents type**

**Reminding parents type**

**Inevitable play to parents type**

---

**Fig. 1-4** Initial concept: a design that allows parents who are ready to spend time with their children create what they are imagining during playtime.
Hypothesis

My thesis solution was reached by considering a particular progression: first, the spatial concept of children watching television and parents occupying the room at the same time; second, the relations between television, children, and parents in the living room; and lastly, all the possible scenarios of life in the living room with the children, parents, and television.

1. Actual and metaphorical distances

Picture a family: a mother, father and children sitting on the couch and focusing on the television. With no conversation, the metaphorical distance between family members is great, though the actual distance between them is small. Even though they are all watching the same screen and are in the same room, they are not sharing the experience.

2. Relationships: parents, children and television

Television and children:

Television is extremely effective at keeping children focused for long periods of time. It holds their attention better than books, stories, or many other media. If televisions played a positive role in children's development, it would be a superior babysitting method.

Children and parents:

Children and parents are perfectly matched players. They have the ability to share most household experiences, in particular, living room activities. This room is the perfect place for sharing and creating experiences with children and for joining children's play time. Because this room is so important for parent-child interaction, it is important to find a good medium to interest both the parents and children simultaneously.
Parents and Television:

While there may not be an extremely significant relationship between parents and television, the TV may serve an important role in making playtime exciting and stimulating dynamic communication between parents and children. The on-screen stories can provide inspiration to parents for new ways to play with their children. If parents can use the television properly, they can harness its effectiveness and efficiency.

3. Possible scenarios with children, parents and television

Parents and children do not need to struggle to keep the television on all the time. The television is often on for no specific reason, and both children and parents can be found watching the same movie repeatedly. This situation is entirely avoidable.
Chapter 2. Design research

User research

The target demographic of the thesis project is preschool-age children (3-6 years) and their parents. The critical first step in this project is researching the childhood developmental characteristics of preschoolers. Research into the development stages for this age group and the relationships between childhood development and play will allow this thesis to adequately approach methods for design solutions.

Childhood developmental stage for preschoolers

Jean Piaget (1896-1980) tells us that preschoolers are in the "Preoperational Stage". This stage extends from the time a child starts speaking to when the child reaches approximately seven years of age. In this stage, children apply new knowledge of language and begin to use symbols to represent objects. In the early portions of this stage, a child will also begin to personify objects, thinking of things and events which are not present at the time. The child's thinking is "influenced by fantasy - the way he would like things to be - and he assumes that others see situations different from his viewpoint." (J. E. Johnson, *Play and early childhood development*, 1987)

![Real objects and events → Taking information → Changing it in the child's mind](image)

**Fig. 2-1** The order of representation of imaginary objects
The characteristics of the preschool age group become clearer when the Preoperational stage is compared with the chronologically previous (Sensorimotor) and next (Concrete) stages. According to Piaget, the Sensorimotor stage begins at birth and extends until the child reaches two years of age. In this stage, children cannot create mental representations of objects outside their immediate view. The Concrete stage begins at first grade and extends through early adolescence. During this stage, children's mental acuity increases dramatically. "A child in the concrete state develops an ability to think abstractly and to make rational judgments about concrete or observable phenomena, which in the past he needed to manipulate physically to understand." (David Elkind, *Children and Adolescents*, 1970)

One of the principal characteristics of the preschool-age group is the significant development of the children's understanding of intangible things. Children develop new attitudes toward the unseen and subsequently broaden their world. Building fantasy worlds prepares them for the next stage in abstract thinking. Parents can aid this development by encouraging their children's imaginings and helping them create vivid fantasy situations. Interestingly, the use of a neutral palette – neutral words, body outlines, and equipment – can be helpful for creating imaginary worlds based on unseen objects. Children should be encouraged to explore imaginary worlds, and parents' aiding them in this endeavor will accordingly encourage their development through key developmental stages in their childhood.

**Stimulating imagination in preschoolers**

**1. Expanding social skills**

Preschoolers need to learn skills such as sharing, empathy, compromise, and taking turns. Many of these skills can be learned through activities like
dressing up, sharing the playground, and playing games.”

(www.parents.com)

2. Learning the world

Many parents of preschool-age children find themselves faced with the ubiquitous “why?”. Young children often ask this in an effort to learn more about the workings of the world; however, the children’s own answers to this question can be just as important as the parents’ responses. “Parents should try asking them open-ended questions like ‘What do you think will happen next?’ to learn more about what they are thinking.” (Parents, 2007, 2)

3. Physical activity

Preschool-age children also need to learn how to use their bodies. They should participate in physical activities in order “to learn motor skills, coordination, speed and balance.” (www.parents.com)

4. Creative expression

Parents magazine points out that “[kids] of this age need to have outlets for expressing themselves creatively through art, music, and pretend play.” (www.parents.com) Accordingly, parents should provide them the time, space, and materials they need to be able to work out their ideas.

Children have so many significant developmental stages through which they must pass, it seems amazing that they can still have time to watch television at all. Unfortunately, the act of watching television is a one-way relationship for children – they may enjoy watching, but they often do not get anything significant out of it. When children spend too much time on such activities, they miss or delay many essentials periods in their development.
Childhood development and play

Many parents want their preschool-age children to get a good start on their future academics. They may view play as non-educational and therefore nonessential; however, experts regard play as highly important to proper development. “Play, in fact, is the curriculum of preschool. All the fun activities that your preschoolers enjoy are actually building cognitive, emotional, physical, and social skills that he’ll rely on throughout his education.” (Parents, 2007, 4) Additionally, completing visually organized work such as reading an entire book or finishing a difficult puzzle is a learning process that contributes to meaningful childhood development.

According to “Spontaneous Play in Early Childhood” (M.C. Pugmire-Stoy, 1992), there are different levels of ‘play development’. At the preschooler level, both starting kindergarten and remaining at home can bring new dimensions to children’s lives. They gain peers and are exposed to a wide variety of new opportunities and, mostly importantly, use their imagination in new and wide-ranging ways.

Imaginative/pretend/fantasy play

Imaginative play, also referred to as ‘pretend play’ or ‘fantasy play’, reaches its peak during a child’s preschool period. This type of play is crucial to their development at this stage: “[imaginative] play makes an important contribution to the cognitive and social development of the child.” (Piaget, 1972) This type of play allows children to apply their mental abilities to a wider variety of objects and people. “Children who exhibit a great deal of imagination in their play are better able to concentrate, develop greater empathic ability, and are better able to consider a subject from different angles.” (Singer and Singer, 1990) Van der Voort and Valkenburg define
imaginative play as "play [by] which children transcend the constraints of reality by [the] action 'as if'." (1994) Children pretend that they are someone else, that objects represent something else, and that the environment (location in space and time) is different.

In conclusion, the preschool age is the period during which children begin to distinguish between reality and imagination. The various perspectives of fantasy encourage children to continue developing their imaginations.

Fig. 2-2 Play equipment and children's fantasy world: a new object like a ladder could help children refresh their concept of space. (image from www.myriadonline.co.uk)

Childhood obesity as a common risk of excessive television watching

When children watch television instead of exerting themselves physically, they do not burn an adequate number of calories. Their eyes are the only parts of their body that move! This type of television time has serious health disadvantages. Children today are gaining weight and losing time. Lloyd Kolbe, PhD and Professor of Applied Health Science at Indiana University, points out that "[we] are raising the first generation of children who will live a less healthy life and die younger than their parents." 2005
Relevant environmental research

The target case of this thesis work is the scenario in which the children, their parents, and the television are occupying the same space (such as when all are in a living room). The following research covers the environmental issues brought to light by the overuse of the television: the interactions between parents and children at playtime, the effects on fantasy play when children play in front of the television, and the lack of family relationships in the television viewing area.

Parents and their children’s play

This thesis studies the reasons parents do not join their children in playing. The emphasis of this concentration is on parental laziness; however, research has shown that even the laziest of parents do not experience indifference toward their children. Most parents feel responsible for leading their children in positive activities, and have tried in the past to join their children in such ventures. Often, parents depend on DVDs or television to help them because they are confused or unaware of proper parenting methods. Jeffery Johnson of the Columbia University College of Physicians and Surgeons points out that even when parents are playing DVDs, “most parents watch with their children more than half the time.” Design can step in at this point and suggest changes to the parents’ habits and encourage them to act positively.

Living room fantasy play using the television

Television watching is not an entirely negative process. It was mentioned previously that the television is a very efficient tool for holding children’s attention for extended periods of time. If a television can be made
to motivate children's fantasy play, then my final design solution should retain this advantage. Stories on the screen can be a good source for preschoolers' pretend play, and, indeed, we often see young children acting out roles from movies or television. "Televisions can stimulate children's creativity by providing ideas to draw upon during creative tasks," (Gardner, 1982) and a DVD provides perfectly "prepackaged fantasies that require little mental effort." (Salomon, 1984) When the child has viewed the DVD enough time, he or she can reproduce the set and storyline in the living room. In this manner, DVDs can be a good influence: the movie environment stimulates children's creativity and imagination.

Fig. 2-3 Movie-based toys – many movie plots can be found in children's pretend play

According to D. Anderson's book "Early Childhood Television Viewing and Adolescent Behavior," one major consequence of television watching is the creation of a common consciousness and the ensuing equivalence of experience on imagination and communication. Certain tools
can be useful for reproducing ideas in real space; experts advise that "[while] television, videos, and movies can set up scenarios for role-playing and imaginative fun, parents should not rely on Walt Disney alone. To help your child make the most of a viewing experience, parents need to take the time to watch the show or film with [the child]. Afterward, parents can talk about the plot and the characters and act them out together." (Parents, 2007, 4)

Fig. 2-4 Realizing ideas: drawings, construction toys, makeup kits and pretend toys are good methods for creating real forms from the imaginary.

Books have traditionally been regarded as the best means of influencing children's creativity and imagination, in large part because there are so many problems associated with television and its effect on children's mental sharpness. Television, unlike radio and print media, presents viewers with ready-made images, thus leaving little room for the viewers to form their own impressions. Television plot lines consist of speedy story developments that allow one to view passively, without having to really think about the storyline. Additionally, television alone struggles to positively influence children, and must rely on tools such as construction toys to help children form imaginary worlds.
Losing family interaction

Usually, the living room (or ‘family room’) merges the parents’ rest area, the children’s play area, and the television viewing area into one singular space. The setup of a typical room keeps all users in close proximity even when all are engaging in separate activities. However, the purpose of the living room is defeated when parents and children are together in the same space but do not communicate or otherwise participate in family activities. Parents often feel that they do not need to participate, especially when the television is turned on. In this way, many parents believe that when the television is on their proper parenting role is to sit on the couch and rest while the children watch TV.

Current market research

Construction toys as tools for building imaginary worlds

Marily Segal, PhD and coauthor of “Your Child at Play: Three to Five Years” (1998) teaches that “[playing] with construction toys such as blocks helps kids learn three-dimensional spatial reasoning, which is the basis for later lessons and geometry, physics, architecture, and engineering.” Parents need not even purchase industrially produced construction toy packages; by providing children with a simple cardboard box, they are enabling the construction of an imaginary house, village, or neighborhood. Parents can attempt to limit their children’s television viewing time by encouraging them to build their own worlds in which to play.
Fig. 2-5 Pretend play using cardboard playhouse: the child was exited to build an imaginary place inspired by a DVD. Unfortunately, this playhouse is too large to leave constructed in the living room, and the child looses interest quickly because of the limited nature of the completed playhouse.

Construction toys on the market

Fig. 2-6 Construction toys on the market
The wide variety of construction toys on the market today can be organized by both scale and rigidity of usage. Toys that do not have fixed usage or building methods allow children greater freedom to represent their imaginary worlds, and larger scale construction toys provide children the opportunity to create more realistic worlds for themselves. However, larger scale toys are not always practical for use in family spaces.

**Design consideration: hypothesis**

The aforementioned research has shown the importance of children's developing the ability to think of intangible matters. This kind of thinking prepares the children for abstract thinking at higher levels and in subsequent stages of development. Several methods of encouraging preschoolers have been demonstrated: the creation of fantasy worlds in real space, holding discussions of fantasies and imagination, and extending creativity into other areas of the children's and families' lives. This encouragement is essential for parents as it enables them to enter their children's fantasy worlds without fear of intrusion: when the parents help build the space, they will always be welcome there. A design that allows children to construct their fantasy worlds in the physical space between their play area and their parents' rest area would be ideal. This placement would reduce the incidence of the one-way interactions with the television set in that the children would begin imagining their fantasy worlds in front of the screen, and would then focus on an actual structure instead of continuing to focus on the television. This solution would increase children's social skills by encouraging them to interact with their parents, teaching them worldly
matters through building actual structures, and helping them express themselves creatively.

Construction toys

Because television influences children's imaginary worlds, children sometimes need help keeping the world of the screen imaginary. Construction toys help children form their fantasy world in the real environment, in that the structured toys exist in their immediate space. A child can use fantasy notions derived from a DVD to motivate the building of a world with construction toys and continue the development of the constructed world long after the on-screen story has disappeared. Toys that form unrealistic environments are especially beneficial for preschoolers' development and overcoming the risk of heavy usage of screen media.
Chapter 3. Design process

Early design

Design challenge 1:
The conjunction between children’s play and parents

I have attempted to create a conjunction between the children's play time and the involvement of the parents. With this juxtaposition, I intend to give the children control over their parents' involvement – they can invite their parents into their fantasy worlds and the parents can participate secure in the knowledge that their children invited their presence. In this concept, children use their construction toys in areas where parents sit to rest. Children join in the television watching and create a combined experience.
Idea #1: flexible materials

Flexible materials, when at the correct weight, can be easily molded by children. With the use of flexible panels, children can create new fantasy spaces in the middle of the family living room, or can create a bridge-type connection to the nearest parent. Additionally, because the flexible materials can be easily folded and stored, parents will be more comfortable allowing the toy’s construction in the living area.

Fig. 3-1 Usage of flexible material
Idea #2: a base structure with extension pieces

First, the base structure is placed on the couch where the parents are resting. Next, the children add extension pieces in order to construct a fantasy world. When the children cease playing, the parents can easily remove the pieces.

Fig. 3-2 The base structure
Idea #3: adjustable height

Adjustable height enables the children to determine the size of the space they create, and also allows the parents easy access to the children's play area via the top panel.
Design challenge 2: continuous play

Generally, construction toys have clear assembly instructions. Children have few options for continuing the construction or play after they have finished following the instruction manual. This thesis considers ways in which continuous play can be facilitated, including via unfixed forms. Unfixed forms allow the children to continuously modify the shape of the construction and to play or create a fantasy whenever and to whatever extent they wish.
Idea #1: endless rolling and bending

There is no concrete form in this concept. Children can create any form they want. The only tool the children might need is a set of clips to anchor the form until they want to change it again.

Fig. 3-4 Endlessly rolling and bending
Idea #2: continuity with multi-directional collapsibility

In this concept, the children can fold the pieces up to create a closed space. The pieces can be folded numerous different ways, and the space can be entirely closed or have as few as one wall. When the space is left partially open, parents can visit their children inside. In addition to the creative advantages for the children, this form has the advantage for the parent that a collapsible toy can be more acceptably kept in the living room.

Fig. 3-5 Multi-directional collapsibility
Idea #3: rotation and changing directions

In this concept, children rotate a board on which they have placed an object. The board rises to the parents' eye level so they can take or view the object. The body of this construction toy can also rotate by itself so the top and the bottom of the toy entirely reverse themselves. Children and parents can modify this toy many different ways (see image on next page).

Fig. 3-6 Rotating panels can be the ceilings and walls of a playhouse.
Fig. 3-7 Rolling construction toy

- Children and parents can open this box in any direction
Scale model study

This model displays one of my early concepts at full scale. This model was multi-directional and could be used in a variety of ways to accommodate different stories during pretend play. The drawbacks of this design were the impractical size (it was too large for a standard living room) and the uncomfortable shape – the parents had difficulty accessing the side opposite the one the children were using. Additionally, this form did limit the types of pretend play for which it could be used. After making this model, I decided the design solution needed to be free-form, collapsible and easily adjusted for size.

Fig. 3-8 Rolling construction toy – can be opened on any side
Design directions for final design

My previous design studies demonstrated the importance of my design's being placed in an area easily accessible by both parents and children, being made of a material that is easy to move and use for building, and having the ability to be constructed in many different ways in order to cover many types of scenarios, thereby holding the attention of each and every user.

**Location**

The construction toy is placed on the intersection of the parents' rest area, the children's play area, and the television viewing area. This intersection is the best choice in the living room, as it provides the greatest number of creative scenarios for children, parents, and the television. When parents and children occupy this intersection together, they can interact easily and frequently.

Fig. 3-9 Areas in the living room
Materials

The construction toy needs to integrate both soft and rigid elements. The soft parts are free forming and can be easily removed, while the rigid pieces can be used to fix the form of the soft parts while the children play. These harder pieces would be made of polypropylene, a plastic material which is one of the most versatile polymers available. It can be used as either a plastic or a fiber and is suitable for many different applications, including most of the plastic end-user markets. Polypropylene also has good chemical resistance and can be used safely in children’s toys. This material is often manufactured via extrusion blow molding (usually used to make bottles and containers such as car fuel tanks) or injection molding (used to produce more plate-shaped forms or solid products, such as car bumpers, television cabinets, electrical switches, and bottle lids). This toy would be produced with injection molded polypropylene.
Step1. Material is introduced into the injection molding machine via a hopper.

Step2. The injection molding machine consists of a heated barrel equipped with a reciprocating screw (driven by a hydraulic or electric motor), which feeds the molten polymer into a temperature-controlled split mold via a channel system of gates and runners.

Step3. The screw melts the polymer, and also acts as a ram during the injection phase. The screw action also provides additional heating by virtue of the shearing action on the polymer.

Step4. The polymer is injected into a mold tool that defines the shape of the molded part.

Step5. The pressure of injection is high, depending on the material being processed; it can be up to one thousand atmospheres.

(Source: British Plastics Federation)
Chapter 4. Final design

Construction toys for every type of pretend play

Initial appearance of the final product

As stated in Chapter 3 (Design Process), the construction toy is placed on the intersection of three areas: the parents' rest area, the children's play area, and the family's television viewing area. The toy is constructed with many soft parts in order to encourage the creation of any shape the child desires. The soft parts are easy to assemble and disassemble.
Study of flexible parts

I looked to packaging industries for appropriate soft materials. In studying the packaging company OrCon Industries Corporation in LeRoy, NY, I discovered the possibility of cutting forms into any shape using CAD. I designed patterns for the forms that optimized the dynamic movement of the material itself.

Fig. 4-1 Study of flexibility
Study of structures

The structure of the toy must speak to both parents and children and also be easily physically reachable by both parties. Parents should be able to see the activity and join in the play.

Fig. 4-2 Study of structures
Design solution - The Slinky Base

Fig. 4-3 Slinky Base

Contents of the Slinky Base package

A Slinky base package contains the following parts and accessories:

A play mat

Place this hexagonal play mat in the living room near the television. This unit is similar to a standard play mat.

Wall units

Wall units are available for individual purchase.

The ends of the flexible wall pieces attach magnetically to the metal balls on the base panel and UFO discs. By bridging separate balls or discs, children can create partitions or fully closed spaces.

UFO discs

This unit may be purchased individually.

Connect furniture to the Slinky Base by placing the UFO disc onto available furniture space.
Magnetic Connections

The units are connected by medium-strength magnets.

Fig. 4-4 Magnetic connections

Fig. 4-5 Magnetic connections in the model
Connecting the children's fantasy world to the parents' rest area

The UFO disc is attached to the couch via elastic loops, and can be used to build an arch between the base and the disc.

Fig. 4-6 UFO disc

Fig. 4-7 The wall unit connection between the base and UFO disc
Fig. 4-8 The ways change the form via the magnetic force
Wall unit details

These wall units are the most easily formable, as they are fairly free-form in their natural state.

Fig. 4-9 The composition of form units

Fig. 4-10 The process of making wall units
Fig. 4-11 The handling of wall units
The final design and its users

When children’s imaginary worlds are inspired by stories from screen media, their pretend play will have a strong and extensive backstory. With the Slinky Base, the pieces are completely non-standard, so the children can build more individually creative worlds regardless of whether or not the television is turned on.

The design solution and child user (see image on next page)
1. At the beginning of the play, the child fixes a side first, then stretches the opposite side.

2. When the child connects the side to the other edge of Base panel, he has a relatively enclosed space for himself.
3. The child can use the couch as a supporting part.

4. By using the Disc on the couch, the imaginary space is extended to the couch, where parents are resting.

Fig. 4-12 The design solution and child user
The design solution and child/parent users

1. When the child plays right next to the parent, it is easy to get attention from parents.

2. Additionally, they can have a conversation about the child's imaginary world.

3. The parents and the child feel they are in close contact both physically and emotionally, so actual interaction has easily happened.

Fig. 4-13 The design solution and child/parent users
The model of Slinky Base

Fig. 4-14 Graduate thesis show at The Bevier Gallery
Fig. 4-15 Graduate thesis show at The Bevier Gallery
Chapter 5. Conclusion

Over the course of this thesis project, I have sought alternative solutions for the limitations of current parenting methods of using screen media to babysit. I have always regretted so many children's spending so much time sitting unproductively in front of the television. I cannot say that using DVDs to babysit is an entirely bad solution, because parents today lead such busy lives; however, I believe parents can decrease the disadvantages of DVD viewing by adding the following principles: first, that watching DVDs can be used positively to help children's development; and second, that parents can be better playmates for their children than they believe they can be. Therefore, the final solution would retain the benefit of the television as a vehicle for creative motivation and messenger of various ideas to children, and would help parents recognize how well they are joining in their children's play.

A television can be as fine a source of material for childhood development as books or recorded tapes. In fact, it has the potential to be even more useful for children because of its ability to hold their attention for long uninterrupted periods of time. Television can also convey messages more easily than can other media. This same quality, though, can also be detrimental to children in that it gives children less space to develop their own imagination. This situation often happens when children do not have enough time to think deeply about a story they have memorized already, and find themselves as a result watching the same movie repeatedly. If television were able to provide children with the time necessary to create their own expression and develop their imagination, it would benefit the child's
development and creativity. The Slinky Base, a construction toy kit, positively reinforces children's fantasy world creation and transforms 'watching' behaviors into 'extended' behaviors. Young viewers can continue playing with the Slinky Base even after the television is turned off. Eventually, these children will be able to play exclusively with the Slinky Base, without needing the television at all.

Parents generally feel able to babysit their children more frequently when in a relaxed setting. The Slinky Base takes advantage of this concern via its location – it is placed near the areas where parents prefer to rest, such as the living room couch. The Slinky Base has incorporated the benefit of the parents’ attention by merging their children's playground and the parents’ own comfort zone. Additionally, the Slinky Base attracts the interest of users of all generations by virtue of its creating a confined space right where it will attract everyone’s eyes. Thus the Slinky Base will enhance the parents’ curiosity about the toy and will help bridge their thoughts and the children’s fantasy world. The new behavior adopted by the parents and created by the Slinky Base will improve the relationships between children and parents by enabling them to share each other's imaginations.

Finally, the Slinky Base will boost children's cogitation and psychomotor skills, and most importantly, will improve their communication with their parents. In addition, parents feel a closer bond with the children and their imaginary world than they would otherwise through the television. The Slinky Base creation is the final design solution of my thesis.

To wrap up, I would like to note the most essential details I learned during the course of this thesis project. The first is the breaking of existing standardized formats. While I was studying possible forms for product design, the majority of those already in existence had hard covers and frames. Even though I had been aiming for total creativity, I realized that
many of my designs still relied on the standard beliefs and basic forms already in use today. Another mistake I made was creating complicated designs that were difficult to use in an attempt to create many different movements and play types. These designs violated my basic design principle of encouraging and facilitating creativity in that they required the user to follow rigidly structured instruction manuals, and thus prevented the users from doing most of the creative work. After much consideration and experimentation, I was able to reduce the materials to their native forms and thus reduce their associations with existing objects. The characteristics and form of this material make it perfect for this application, as it is able to mimic and make the most of children’s actions. The Slinky Base utilizes elements which, in their original context, appeared futon-like, incorporating them as wall units into a complete structure which can be freely formed and built according to user desires. The materials can be used to form a doll house, secret shelter, or any other type of construct the children can imagine. If I had not expanded my thinking away from current designs, my solution would have been made of more rigid materials and would have been more restrictive in its design – it would have limited the ways in which it could be formed by the children. The type of pretend play my design encourages allows for maximum creativity in developmental play and individuality of expression, yet still utilizes the television. I very much enjoyed this entire process and learned much more advanced design thinking.
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